STATE OF MINNESOTA DISTRICT COURT

COUNTY OF RAMSEY SECOND JUDICIAL DISTRICT

- -

The State of Minnesota,
by Hubert H. Humphrey, III,
its attorney general,
and
Blue Cross and Blue Shield
of Minnesota,

Plaintiffs,

vs. File No. C1-94-8565

Philip Morris Incorporated, R.J.
Reynolds Tobacco Company, Brown &
Williamson Tobacco Corporation,
B.A.T. Industries P.L.C., Lorillard
Tobacco Company, The American
Tobacco Company, Liggett Group, Inc.,
The Council for Tobacco Research-U.S.A.,
Inc., and The Tobacco Institute, Inc.,

Defendants.

- -

DEPOSITION OF PHILIP MORRIS INCORPORATED

(DESIGNEE CATHY ELLIS)

VOLUME II, PAGES 293 - 543

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(The following is the continued deposition of PHILIP MORRIS INCORPORATED (DESIGNEE CATHY ELLIS), taken pursuant to Notice of Taking Deposition and Rule 30.02(f), by videotape, at the offices of Dorsey & Whitney, Attorneys at Law, 250 Park Avenue, 16th Floor, New York, New York, on September 26, 1997, commencing at approximately 9:22 o'clock a.m.)

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I N D E X

EXHIBITS		DESCRIPTION	PAGE MARKED
PM	1321	March 15, 1984 Pyrolysis of Tobacco: I: Enhanced Delivery of Tobacco Flavor Components with Ammonia, Bates 2056130247-85	386
	1322	February 5, 1992 interoffice correspondence, Gullotta to Kinser, Bates 2028813482-3	396
	1323	October 30, 1991 interoffice correspondence, Watson to Distribution, Bates 2047348173-8	397
	1326	15 Nov. 94 letter, Reininghaus to Ellis, Bates 2025988909-12	402
	1327	The Effects of Cigarette Smoke "pH" on Nicotine Delivery and Subjective Evaluations, Bates 2025988913-4	402
	1328	DSM-IV excerpts, 3 title pages and pages 175-194, 235-248	447

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1329	The Current Situation of Smoking and Health, April 1974, Bates 2028635795-847	476
1330	Prospectives for CTR in Relation to CNS Studies, Bates 2057769088-94	486
1331	November 29, 1977 interoffice correspondence, Osdene to Seligman, Bates 2023192379	489
1332	June 1, 1983 Behavioral Pharmacology Annual Report - 1993, Bates 1005215302-11	519
1333	June 29, 1983 Electrophysiological Studies 1983 Annual Report, Bates 1000419009-68	520
1334	May 9, 1994 letter, Ellis to Waxman, Bates 2028812092-3	525

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P R O C E E D I N G S

(Witness sworn.)

CATHY ELLIS

called as a witness, being first duly sworn, was examined and testified as follows:

ADVERSE EXAMINATION

BY MR. GORDON:

Q. Good morning, Dr. Ellis. I know we met yesterday, but let me reintroduce myself. My name is Corey Gordon. I'm an attorney for Minnesota, and I represent the State of Minnesota and Blue Cross, Blue Shield in a case against Philip Morris and other defendants, a case now pending in Ramsey County District Court in Minnesota. And we're here today to take your testimony in connection with that action.

You understand that your testimony is being transcribed and videotaped and will be played to the -- to the jury at the time of trial of this matter; correct?

A. I understand.

Q. Okay. What is your full name for the record, please?

A. Cathy Lynn Ellis.

Q. And you have a Ph.D. in pharmacology; is that

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correct?

A. Yes, I do.

Q. So it's appropriate to call you Dr. Ellis; is that correct?

A. Some people do.

Q. And what is your title with Philip Morris presently?

A. Senior vice president of research and development.

Q. So you are the top person at Philip Morris in the area of research and development?

A. Yes, Philip Morris USA.

Q. And Philip Morris USA is the U.S. cigarette manufacturing division of Philip Morris Companies; is that correct?

A. That's correct.

Q. Does Philip Morris USA have any products other than cigarettes?

A. No.

Q. Okay. So you are the top research and development person in the -- for Philip Morris cigarettes sold in the United States; correct?

A. Correct.

Q. Okay. And you are --

You understand you're here today to testify as a

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spokesperson for Philip Morris on a number of issues; correct?

A. I understand that.

Q. And particularly this morning we're going to address issues related to research and development and to issues involving nicotine control and manipulation in cigarettes. You understand that?

A. I understand that.

Q. And you understand that in your testimony today you are speaking on behalf of the corporation, Philip Morris, not -- and not just yourself personally; correct?

A. I understand.

Q. You understand that you need to testify not only from your personal knowledge, but whatever knowledge you gained in preparation to testify on behalf of Philip Morris; correct?

A. Yes.

Q. When --

You've been associated with Philip Morris for 17 years; is that correct?

A. Yes.

Q. Okay. All that time in the research and development area?

A. Yes.

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Q. Philip Morris USA is a manufacturer of -- of products that are intended to be consumed by human beings; correct?

MR. FOWLER: Object to the form.

A. I would have to qualify that answer because I think consumption generally means eaten; however, I think that obviously cigarettes do produce smoke and consumers do inhale smoke.

Q. Okay. Well let's -- let's clarify that and be a little bit more specific.

Philip Morris produces a product that is intended to generate a substance that will be inhaled into the human body; correct?

MR. FOWLER: Object to the form.

A. Philip Morris produces a cigarette that is used by smokers to produce smoke that is inhaled, yes.

Q. And --

And that's Philip Morris's intention, that the product be ultimately inhaled into the human body; correct?

A. That's the way the product works.

Q. Okay. And that's what Philip Morris intends; correct?

A. That's the way the product works. That's the way it -- the product works. That's the way the

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consumer uses it.
Q. Okay. And Philip Morris intends that that's how the consumer will use it; correct?
MR. FOWLER: Object to the form of the question. It's been asked and answered. She's answered that question.
A. I -- I think there's a -- there's a difference here in the -- in the semantics of this issue. We produce a cigarette. The consumer uses that cigarette.
Q. And the way that Philip Morris intends that the consumer use that cigarette is to inhale the smoke generated from it into the human lung; correct?
MR. FOWLER: Object to the form. It's been asked and answered several times now.
A. I -- I can't go any further than I -- than I have right now. The -- the idea that you're putting forth is -- is some specific indication that there is some design associated with the inhaling of smoke.
We design cigarettes. The cigarettes are designed different ways. They're put in different packs. They're labeled differently. They're different products. The consumer uses those cigarettes, and they can be used differently by the consumers.

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Q. But each and every cigarette that Philip Morris produces and designs and manufactures is designed so that it -- it will be used by a consumer in such a way that it generates smoke that the consumer inhales into their respiratory system; correct?

THE WITNESS: You'd have to repeat that, please.

(Record read by the court reporter.)

MR. FOWLER: Object to the form, asked and answered.

A. It is designed so that the consumer can use it in that way, yes.

Q. Okay. And you would agree that a manufacturer who is -- who is making a product that is going to create something that is inhaled into the human body has a duty to try and find out as much as possible as to what the effects of that product are going to be on the consumer; correct?

MR. FOWLER: Object to the form. It calls for a legal conclusion perhaps.

A. I -- I agree that any manufacturer of any product should understand its product, yes.

Q. And in particular, in the case of a manufacturer of a consumer product that's going to affect the human body, that manufacturer has a responsibility to

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make sure it knows and understands as much as it possibly can about what effects that product is going to have on the human consumer; correct?

MR. FOWLER: Object to the form.

A. As I indicated before, I think it behooves any manufacturer of a product to understand the product and all of the aspects of its product in its interaction with the environment and with any living form.

Q. Okay. Well for example, a manufacturer of -- of a book doesn't have to worry about the effects that that book is going to have on the human respiratory system; correct?

A. Obviously -- well, if you want to carry it further, there's potential for that with the inks and other things. However, I think the manufacturer of a book does need to worry about the contents of that book and in terms of how it might affect children and other things.

Q. Okay.

A. So I think there are a number -- we can take that very broadly, and I think that every manufacturer, every consumer products company needs to be concerned about the impact of their product, yes, and needs to understand it, try to understand it

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and needs to study it.
Q. Right. They need to know how the product is going to be used and what effects it might have; right?
A. That's part of that.
Q. Okay. And particularly in the case of a product that's going to actually be consumed or ingested into -- into the human being, the manufacturer has to do as much as it can to find out if there are going to be any deleterious health effects on the consumer; correct?
MR. FOWLER: Object, asked and answered.
A. Yeah, I -- I've just covered that very broadly. I -- I think that all effects are -- need to be looked at, and I don't think it's appropriate to limit them to any one category.
Q. And if there are potentially adverse health consequences with a -- with a product such as a cigarette, the manufacturer has a responsibility to do as much as possible to eliminate those health effects or minimize them; correct?
MR. FOWLER: Object to the form.
A. I've already stated that I think that it's absolutely essential that consumer products companies understand their product and understand the measures

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of their product and -- and work to make the best product possible for the consumer.

Q. Okay. Well beyond understanding -- and -- and perhaps you said it when you say that they need to make it --

MR. FOWLER: Work to make it best.

Q. -- the best product possible -- is that one of the responsibilities of a manufacturer is to do whatever it can to eliminate or minimize adverse health consequences; correct?

MR. FOWLER: Hold on for a second.

Object to the form, but you can go ahead and answer that.

A. Could you repeat it, please.

Q. Well I'll -- I'll -- I'll try it again --

A. All right.

Q. -- because maybe that's a little confusing.

A. All right.

Q. Let's start. Number one, you agree that Philip Morris has a responsibility to understand as much as possible about its -- its products, its cigarettes?

A. Yes, I agree Philip Morris does and I agree all consumer products companies do.

Q. Right. And number two is it has a -- it has a responsibility to eliminate or minimize any adverse

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health consequences of its product; right?

MR. FOWLER: Object to the form.

A. The issue with your statement as -- as stated is -- is the measurement of, quote, "adverse health effects." I think that -- that in the context of -- of the work, we do the best job we can to -- to measure effects or biological effects. The question of measurement then comes into play when you really define exactly what you mean by that.

So if you mean by a risk factor, for example, you're going to be dealing with a process that may take years to get a numerical value which is not quantitative in nature.

Q. Well I'm not sure I understand the -- the science that you -- you've just said, and I don't know that the jury will. I -- maybe my question is -- is -- is off the reservation here, but just I'm trying to help the jury understand.

Philip Morris believes that it has a duty to minimize whatever potentially bad health consequences might occur to the consumer who uses its cigarettes; right?

MR. FOWLER: Object to the form, may call for a legal conclusion.

A. I think -- I think the duty is associated with

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understanding the product, working with scientists inside the company and outside the company, working together to design products and working with product technologies to address all sorts of consumer issues and desires. So it's a very broad statement. Included in that may be some aspects of what you're discussing.

Q. Well I -- I just want to ask very specifically, and -- and, you know, tell me if --

A. Yeah.

Q. -- you just can't answer this question.

A. Yeah.

Q. But I want the jury to know if Philip Morris believes it has a responsibility to try to make its cigarettes as safe as possible from a health standpoint.

A. Yeah.

MR. FOWLER: Object to the form, but you can go ahead and answer.

A. Yeah. The -- the issue here we have with the terms "safe" and -- and -- and "health," as we were discussing yesterday, and there's no question that I think that Philip Morris -- and let me try to describe this in a technical sense.

It's very difficult to measure health. It's a

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very general term, and so when -- when product manufacturers look at manufacturing their product, they need quantitative measures and they need measures that are short -- more short term than the term "health" per se, so we use a variety of tests. And by those tests, we get an indication, okay, of a quantitative assessment of a variety of different endpoints, and in that there is an assumption. And this is commonly used in the National Toxicology Program and many other areas. This is commonly used as an assessment process.

Now those tests may or may not relate to health. There is a missing link, and that is the problem I have with your question. If you're asking does Philip Morris have -- or should Philip Morris do this research, absolutely. If you're asking does this research relate to health, I cannot make that connection right now.

Q. Whether it does or it doesn't, it's a very simple question. Does Philip Morris believe it has a responsibility to its customers to try to make cigarettes it sells as safe as possible?

MR. FOWLER: Object to the form.

A. I've already discussed it, I believe.

Q. Okay. And you don't believe you can say "yes"

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or "no" --

A. I --

Q. -- they -- they do or they don't believe they have this responsibility?

A. As a scientist, I need a quantitative assessment of what you mean by "safe."

Q. Okay. I'm asking Philip Morris, the company that manufactures cigarettes that are consumed by Minnesotans and have been consumed by Minnesotans for decades. Does Philip Morris believe that it has a responsibility to try to make those cigarettes as safe as it possibly can?

A. I will re --

MR. FOWLER: Objection, asked and answered.

A. I will repeat my answer, that Philip Morris and any consumer products company, to the best of their ability, should understand the product, should do research in the area to the best of the technology that's available and make decisions on product design based on consumer issues and desires.

Q. And the decisions it makes based on those re -- based on that research in part are motivated by its responsibility to make the product as safe as possible; correct?

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MR. FOWLER: Object to the form.

A. There are many aspects to consumer issues and desires.

Q. Right. I want to focus on the health effects. I -- I -- I understand and you -- I think you've made it clear --

A. Right.

Q. -- that there are lots of issues.

A. Right.

Q. My question is very narrow.

A. Uh-huh.

Q. It's on the issue of health effects.

A. Uh-huh.

Q. Does Philip Morris believe it has a responsibility to make -- strike that.

Does Philip Morris believe it has a responsibility to minimize or eliminate any adverse health effects of its products?

MR. FOWLER: Object to the form of the question. This has really been asked and answered a number of times. You can go ahead and take one more shot at it.

A. To the degree that we can measure that, as I've stated previously, yes, it's a component of that.

Q. Okay. And to the extent you cannot eliminate or

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minimize a particular health risk, Philip Morris believes it has a responsibility to tell the consumers of those health risks that it can't minimize or eliminate; correct?

A. I believe that --

MR. FOWLER: Object to the form, but you can go ahead and answer.

A. I believe that Philip Morris has a responsibility to communicate with public health officials and with regulatory authorities and to act within the regulatory purview that is already in place.

Q. Okay. Well let me -- let me approach it a different way.

You agree that consumers want as safe a product as possible, whatever the product might be?

A. Sure.

Q. Okay. And you would agree that consumers want to know of any potential health risks of a product; correct?

A. Sure.

Q. Okay. So you would agree that in addition to minimizing or eliminating any health risks that Philip Morris has, Philip Morris also has a responsibility to make sure that consumers know of

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any health risks that it can't eliminate or minimize; right?

MR. FOWLER: Object to the form.

THE WITNESS: I -- I would have to have that reread again.

MR. GORDON: Okay. Why don't we have it read back.

(Record read by the court reporter.)

A. My answer to that is, as was stated previously, given the current regulatory situation and the situation with our warning labels that are dictated by Congress, we, I think, are operating under a condition whereby we would need to communicate with public health authorities and with Congress in order to communicate in any other way via packaging labeling to our consumers, and that is the process that we would go by and use.

Q. And the end purpose of that is to provide consumers with information about any potential adverse health consequences of cigarettes; right?

A. Well, this isn't something that's been going on in a vacuum. With a number of Surgeon General's reports that have been produced here, there is no absence of knowledge in the -- in the public and in the scientific community and the public health

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community regarding cigarette smoke. There is a regular review of this information. There are, as we had discussed yesterday, probably tens of thousands of publications.

So the information is there. The information is available, and Congress has made a decision to put certain labels on the packs and they have also preempted any other labels. That is the situation we're working on, and that's what we will abide by.

Q. Okay. Dr. Ellis, I -- I apologize. I'm -- I'm kind of a simple guy. I'm from Minnesota. I don't have a Ph.D. I'm just trying to understand, and I --

A. Uh-huh.

Q. -- I think the jury just wants to understand.

Does Philip Morris think it has a responsibility to try and let its consumers know of any health risks to its products that it isn't able to eliminate or minimize?

MR. FOWLER: I'm going to object to the preamble to that question. I also object to the form of the question.

A. I think I've already answered that in the context of what is health per se, what is safety, and in the context of the labels that are already on the pack that do warn to the issues that you're speaking

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of and have for many years.

Q. Who is Helmut Wakeham?

A. Dr. Wakeham was a former vice president of research and development.

Q. He was the former top person in research and development for a number of years; correct?

A. Yes.

Q. Dating back into the early 1960s; correct?

A. Yeah, yes.

Q. Okay. And did you ever know Dr. Wakeham or was he way before your time?

A. Well he was leaving when I first came, but I have met him and so I did know him and he was there at the time.

Q. Have you had -- ever had occasion to go back and read any of the memos or presentations that Dr. Wakeham prepared when he was the top person in research and development at Philip Morris?

A. Yes, I have.

Q. Okay. I'm going to show you what's been previously marked as Exhibit 152.

MR. FOWLER: Thank you.

Q. And this is a -- a document produced by Philip Morris bearing Bates stamp number 1000277423 through 7447, a document entitled "TOBACCO AND HEALTH-R&D

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APPROACH," dated November 15, 1961, and it indicates that it was written by Dr. H. Wakeham. And ask first if you've ever seen this particular document before.

MR. FOWLER: Go ahead and take a minute to flip through it if you need it.

(Witness reviews Plaintiffs' Exhibit 152.)

MR. FOWLER: Excuse me, Corey, the practice in -- in this case is if it's been previously marked as an exhibit, you just leave that exhibit number and don't re-mark it in the depositions? Is that how we're doing it?

MR. GORDON: It's not merely a practice; it's the order.

MR. FOWLER: Even better. Thank you.

MR. GORDON: By the way, the court reporter has the originals if for some reason you want to see it. Just to expedite things, I have copies.

(Witness continues reviewing Plaintiffs' Exhibit 152.)

A. Yes, I believe I've seen this document before.

Q. Okay. And there are just a couple items I want to direct you to. If you could turn to the page that ends in Bates stamp number 434. I don't think there are page numbers on the document itself. Do you see that?

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A. Yes.
Q. What's --
What's the title of this page?
A. "PARTIAL LIST OF COMPOUNDS IN CIGARETTE SMOKE ALSO IDENTIFIED AS CARCINOGENS."
Q. And could you tell the jury what a carcinogen is.
A. A carcinogen is a compound that in certain animals at relatively high doses over their lifetime has been shown to produce tumors.
Q. If I looked in a dictionary, is that what it would say a carcinogen is?
A. I'm not sure. I haven't looked in the dictionary lately.
Q. Isn't --
Isn't the definition of a carcinogen simply something that causes cancer?
MR. FOWLER: Object to the form.
A. If that's the lay definition, potentially.
Q. Well is it a scientific definition of a carcinogen?
A. Absolutely not. It is not a scientific definition.
Q. Carcinogen in science doesn't simply mean cancer-causing agent?

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A. No, because there are all sorts of factors that relate to the conditions under which that agent causes cancer.

Q. I understand there are conditions under which different agents --

A. Right.

Q. -- cause cancer. My question is: Just the word, "carcinogen," --

A. Right.

Q. -- it means it causes cancer; right?

A. No, --

MR. FOWLER: Object to the form.

A. -- it does not. It means scientifically that studies have been done in animals that indicate under certain conditions -- normally the whole animal's lifetime and normally very high doses -- that tumors can be produced and that there is sufficient data in a number of animals for a regulatory agency to make that determination. So regulatory agencies make the determination technically that something is a, quote and unquote, "carcinogen."

Q. Is there a word in science that means "causes cancer"?

A. Is there a word in science that means "causes cancer"? If you're going to use it in the context

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of -- of a general lay process word, you can say something is carcinogenic and, that is, could operate in that process.

Q. Okay. And if something is carcinogenic, that means it's a carcinogen; right?

A. Under certain conditions.

Q. Okay. Now let's go back to this partial list of compounds in cigarette smoke also identified as carcinogens. How many compounds are on this partial list?

A. Approximately 40.

Q. Okay. So of these approximately 40 compounds identified as carcinogens found in cigarette smoke that Dr. Wakeham identified back in 1961 --

MR. FOWLER: Object to the form of the question.

A. I would --

MR. GORDON: I haven't asked a question. Counsel, I'd appreciate it if you'd wait until I'm done with my question to interpose your objections.

Q. So from these approximately 40 compounds identified as carcinogens found in cigarette smoke that Dr. Wakeham identified back in 1961, how many, if any, have been eliminated from cigarette smoke that smokers in Minnesota get from Philip Morris

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cigarettes today?

A. Well let me --

MR. FOWLER: Object to the form of the question.

A. Let me --

MR. FOWLER: It has a faulty premise.

A. Before I can technically address this, you're asking me to now specifically look at the compounds on the list, and I have to point out that in 1961 the methodologies to study compounds is not -- was not as significant and sophisticated as it is today. You are seeing on this list compounds like ethyl alcohol, fructose and glucose, which are sugars, lactic acid, oleic acid, which is a fatty acid. These things generally speaking are common obviously in foods, and under -- I don't know under what conditions Dr. Wakeham made out this list, but these substances would not be considered to be carcinogens today.

So I would question the number of compounds on this list first of all.

Q. Okay. Well let me see if I can ask the question a little bit differently. There's a little tobacco shop on Wabasha Avenue in St. Paul.

A. Uh-huh.

Q. If I walk over to that tobacco shop today and

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I --
A. Uh-huh.
Q. -- pick up a pack of Marlboros and I smoke it, am I going to get any arsenic in my lungs?
A. There are a number of compounds on this list that are in smoke, and over the years, to answer your other question, as tar was reduced, many of these compounds have been reduced. And there have been a number of various techniques that have been used to reduce tar in cigarettes, and many of these compounds have been reduced in the -- in the context of those design changes.
Q. I appreciate you talking about reduction even though I didn't ask about it. My question relates to elimination.
A. Uh-huh.
Q. If I smoke that Marlboro from that tobacco shop on Wabasha Avenue today --
A. Uh-huh.
Q. -- am I going to get any arsenic in my lungs?
MR. FOWLER: I'm going to object to the preamble to that question. You can go ahead and answer the question.
THE WITNESS: Okay.
A. You will potentially get very low levels of --

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of arsenic because arsenic is present in many agricultural products, and therefore you will potentially get that. However, the context here and I think what's important to your point is if you read the Surgeon General's report, they have also done studies and agree that in the context of combustion in burning tobacco, it would be very difficult and the technology does not exist to entirely eliminate those things that are formed under combustion.

Q. By the way, is there any consumer product other than tobacco that is combusted and inhaled into the human lungs?

MR. FOWLER: Object to the form.

A. Not that I can think of sitting here today.

Q. And if we go down this list, are there any ingredients on here that Philip Morris developed technology since 1961 to eliminate from cigarette smoke?

A. There are a number. Through various filters, for example, phenols would be reduced.

Q. I -- I'm -- excuse me.

A. Okay.

Q. I'm not asking about reduction. I'm asking about elimination.

A. Okay.

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Q. It's no longer there. That's the question.
A. As I said be --
MR. FOWLER: Look, go ahead and finish the answer that you were giving if you weren't done with it. And then --
THE WITNESS: Okay.
MR. FOWLER: -- you can -- you can object and -- and move to strike if you think it's unresponsive, but let her answer the question.
THE WITNESS: Okay.
A. There are a variety of compounds on this list, many of which have been impacted by the normal design changes that have occurred in tobacco products over the years. And they have significantly reduced the levels of these compounds in smoke.
The Surgeon General has determined and many other researchers have determined over many years of research that, number one, no one has been able to account for the biological activity by any one of these compounds, so it is not known which one would be potentially the most significant to remove. And number two, the combustion process is such that you're going to create these compounds. Whether you're burning tobacco or paper, you're going to create some of these compounds, and it is going to be

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very difficult under those conditions and technologically not feasible to specifically remove certain of these compounds.

Q. Okay.

A. Much work has been done in this area and there has been much published in this area.

Q. Okay. I do move to strike as nonresponsive, and my -- I want you to tell me if you can answer this question or not: Is there a single compound on this list that has been completely eliminated from cigarette smoke?

A. I would not be able to make that determination sitting here today. I would have to go back to some data.

Q. Okay. What data did you review in order to prepare yourself for this deposition today in order to be able to address these kinds of questions?

A. Well like --

MR. FOWLER: Well let me object to this. I mean, she certainly -- certainly didn't have the opportunity to review any materials that were predesignated by plaintiffs specific to her 30.02(f) deposition and specific to any of the categories in that designation.

But you can go ahead and answer that question

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with that clarification.

A. To the best of my ability and -- and knowledge of what was going to be the topics brought up today, I reviewed internal documents and the external literature.

Q. Okay. And what you reviewed is not sufficient to tell -- to tell and you just can't tell as the top person in research and development at Philip Morris if a single one of these 40 so compounds that in 1961 were identified as carcinogenic and in cigarette smoke has ever been eliminated from cigarettes sold by Philip Morris?

A. Mr. Gordon, I --

MR. FOWLER: Hold on. I'm going to object to the form of the question, also include my previous objection concerning the lack of production or predesignation. But you can go ahead and answer that question.

A. Mr. Gordon, I certainly haven't memorized the volume of materials that have been produced externally on these compounds and internally relative to the chemistry of smoke. It would be impossible for anyone in their head to recite each one of these compounds and the actual level -- levels per se unless they were asked to do so and to memorize that

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list.

MR. GORDON: By the way, I want to note on the record that my failure to address this accusation of a failure to predesignate should not be taken as -- as -- as an acquiescence or a waiver. Indeed we predesignated documents for this deposition the week before they were due under the case management order.

MR. FOWLER: But not consistent with the judge's recent order.

MR. GORDON: Well we're not going to debate that here and now because of timing, but I -- I just want to note that -- for the record that we take strong exception to Philip Morris's characterization of the circumstances of predesignation and will be happy to address that in the appropriate forum and at the appropriate time. I just want to note that we're not acquiescing in what we consider to be a -- a bogus accusation.

BY MR. GORDON:

Q. I'd like you now to turn your -- turn to page with the Bates number 7439.

MR. FOWLER: Just for the record, I like the word "bogus." I disagree with that characterization, but I do like the word.

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Q. Do you see 7439?
A. Yes.
Q. It says "R & D PROGRAM LEADING TO A MEDICALLY ACCEPTABLE CIGARETTE."
A. That's what it says at the top of the page.
Q. And it indicates that there should be three main approaches; is that -- is that right?
A. It indicates that the present knowledge and current research indicate three main approaches.
Q. One of them is to reduce irritating factors in smoke; correct?
A. That's what it says.
Q. The next one is to control nicotine in the filler and smoke; correct?
A. That's what it says.
Q. Okay. And the third is reduction of the general level of carcinogenic substances in smoke but without complete elimination of more than a few specific compounds; right?
A. That's what the document says.
Q. And it's on number three that reduction of the general level of carcinogenic substances, it suggests that it -- the cost and time guesstimate is $10 million and seven to ten years; correct?
A. That's what it says.

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Q. Okay. And I want to now just jump ahead to page 7442. Okay. And this is a -- a more detailed discussion of the project of reducing carcinogens in smoke; correct?

A. It says "REDUCTION OF CARCINOGENS IN SMOKE." I would not characterize it as a project at this point.

Q. Okay.

A. I think it is Dr. Wakeham's ideas and thoughts.

Q. Right. And he says "To achieve this objective will require a major research effort"; right?

A. That's what it says.

Q. And he -- he offers four reasons why it's going to require a major research effort; right?

A. There are four reasons there, yes.

Q. What's the first reason?

A. "Carcinogens are found in practically every class of compounds in smoke."

Q. Okay. Has that observation proven to be incorrect?

A. There is no question that there is biologically active material in much of the fractions that were looked at. There's no question about that. Whether or not they are carcinogens is another question.

Q. Okay. Number two, what's -- what's his second

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reason why it will require a major research effort?
A. "Present technology does not permit selective filtration of particulate smoke."
Q. Okay. Is that still true today?
A. Absolutely.
Q. Okay. Number three, what's his third reason?
A. "Flavor substances and carcinogenic substances come from the same classes, in many instances."
Q. Okay. Is that still the case today?
A. I really don't know what he means by that to be frank.
Q. Okay. Well one of the things that Philip Morris contends its cigarettes do is give flavor to consumers; right?
A. Yes.
MR. FOWLER: Object to the form.
A. Certainly smokers smoke for taste. However, subsequent to 1961 we've done a lot of work to try to understand the taste and flavor of smoke, and I have to represent that today we still don't understand that. So I think he was speaking without data.
Q. Well whether he was speaking without -- with or without data, I just want to know if you -- if Philip Morris in the 36 years since this was written has -- has determined that this is not true; in other words,

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flavor substances and carcinogenic substances come from the same classes.

MR. FOWLER: Object to the form of the question. It's argumentative and it misstates the witness's prior testimony.

A. We have certainly found out that there is not data to determine that it is true.

Q. Okay. And what's the fourth reason?

A. "Many pyrolysis products have multiple precursors in tobacco."

Q. Okay. Let's break that down so the jury understands. What's a pyrolysis product?

A. Well it's a very specific type of process that is -- undergoes during actually heat and it can be basically done in a environment whereby you can have air or argon or you can have nitrogen, and so it is an artificial type of situation in a glass sealed tube under a certain atmosphere. So pyrolysis is a type of combustion process that is very specialized in -- in nature.

Q. Okay. Well can we simply say so that the -- I and the jury understand that when you talk about a pyrolysis product, you're talking about something that comes from burning a substance?

MR. FOWLER: Object to the form.

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A. Not necessarily. "Pyrolysis" is -- is -- "burning" is a -- is a very broad, general term. "Pyrolysis" is a very specific term, and it has to do with heat and it has to do with basically the compounds interacting, and maybe even melting could produce pyrolysis products. So you -- you don't necessarily have to burn in that context.

Q. But it does involve heating; correct?

A. It does involve heating.

Q. Okay. So if I go buy a Hershey bar and eat that, what I get into my body is going to be different than what I get if I go buy a Hershey bar and I heat it and inhale whatever gaseous vapor comes off of the heated Hershey bar; right?

MR. FOWLER: Object to the form of the question.

A. There's -- there's no question that heat does change the chemistry of materials if that's what you're asking.

Q. Okay. And what are --

What is a precursor?

A. Precursor is the material that is the -- hmm, try to use a different word -- that -- the materials that go into making up something else, so it's the -- kind of the ingredients that would make a product,

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for example.

Q. Okay. So the --

A particular product that comes from heating a substance, the precursor would be the substance that you heat that generates the pyrolysis product? Is that a simple way of putting it?

A. I'd have to have that reread.

Q. Well let -- let me try it a different way.

A. Okay.

Q. If you heat chemical X and it turns into chemical Y, Y would be the pyrolysis product of chemical X; right?

A. Yes. It's -- that's one way, one potential way; that is, if you're looking especially at breakdown. However, in pyrolysis products you can have things being synthesized and put together.

Q. Okay. I'm just --

A. Okay.

Q. -- just to keep it real simple.

A. Okay.

Q. And if in that heating X leads to Y, X would be the precursor of Y; right?

A. Yes.

Q. Okay.

A. Potentially.

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Q. And if --
A. One of the precursors, yes.
Q. One of the precursors. Now maybe if I took chemical Z and heated it, it might also turn into chemical Y; is that possible?
A. Yes.
Q. Okay. And in that case either X or Z could be a precursor to Y; right?
A. Potentially.
Q. Okay. So --
A. Hypothetically, yes.
Q. -- could that be what this sentence means, number four, that there are -- that there are different chemicals in cigarettes that if you heat them, if you pyrolyze them, can lead to the same precursor?
A. Not lead to the same precursor.
Q. Excuse me, lead to the same --
A. Lead to the same compound, yes.
Q. Lead to the same pyrolysis product.
A. Right. So you might say that cellulose and sugar under pyrolysis conditions could lead to similar types of pyrolysis products, yes.
Q. So even if you eliminate compound X, if compound Z is still in there, you still might get Y?

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A. That's true, potentially.

MR. FOWLER: Are you keeping these letters straight?

(Laughter.)

Q. And if compound Y happens to be carc -- carcinogenic, just eliminating X in that hypothetical won't eliminate the carcinogenic substance from the product; right?

A. If I understand what you said, I think you're saying that it's very complex and that there are multiple potential pathways to lead to certain compounds in smoke, and yes, you're absolutely right, it is very complex and there are multiple precursors to compounds in smoke.

Q. And that was true in 1961?

A. Still is.

Q. And it's been continuously true ever since then; right?

A. Yes.

Q. Okay.

A. We do understand more about it.

Q. Okay. Now one of the things that you believe that Philip Morris -- strike that.

One of the things that Philip Morris believes it should do is -- is do biological research on its

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products; right?
A. Well we certainly do that, yes.
Q. Okay. You do it now; right?
A. Yes.
Q. Okay. There was a period of time when the cigarette -- cigarette industry had a gentlemen's agreement not to do biological -- biological research; correct?
MR. FOWLER: Object to the form of the question, lack of foundation.
A. I have heard of such a notion; however, I have to say that I have personally never experienced that because, in my understanding and review of all the documents, we've been doing biological research since the 1950s or '60s.
Q. Okay. And you understand you're testifying not just from your personal knowledge, but the knowledge of the Philip Morris company; correct?
A. That's why I'm saying that. I wasn't probably old enough to -- to -- to be an employee at that time, but certainly from everything I've read and everything I understand, there has been biological research going on continuously for over 50 years.
Q. Okay. I move to strike that as nonresponsive. My question is --

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MR. FOWLER: It was entirely responsive.

MR. GORDON: Counsel, you can argue that to the judge. Let's not clutter up the record with your comments and rulings on your own objections or my objections.

Q. My question is: Does Philip Morris acknowledge that there was a period of time when the cigarette industry had a gentlemen's agreement not to do biological research on cigarettes?

A. I have to speak from what I know. What I know is I've read documents about the -- using those terms. I have to say that, based on all the documents I've read, there's no indication of such an agreement as it relates to Philip Morris because there's a continuous effort of biological research for at least 50 years.

Q. Okay. My question is -- and -- and perhaps you've answered it. Let me -- let me clarify.

A. Okay.

Q. You're -- your testimony is, on behalf of Philip Morris USA, that Philip Morris contends that there never was a gentlemen's agreement not to do biological research?

A. I didn't say that. I said I do recognize --

MR. FOWLER: Just a second, just a second.

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THE WITNESS: Yes.

MR. FOWLER: Object to the form of the question. It's been asked and answered.

Let's go off the record for just a second.

(Discussion off the record between Mr. Fowler and Mr. Sipkins.)

MR. FOWLER: Could we just take a short break?

MR. GORDON: Sure.

THE REPORTER: Off the record, please.

(Recess taken.)

MR. FOWLER: The last question posed asked a question concerning Philip Morris USA when Dr. Ellis has been testifying more generally on behalf of Philip Morris, as the plaintiffs have configurated Philip Morris for the purposes of this litigation, and I just don't know whether it was unintentional, but the witness's answer was with regard to Philip Morris and not limited to -- to USA. And I think that -- that if we move back and forth between those entities, it will get confusing.

MR. GORDON: Well let's clarify that just for -- for the record here.

BY MR. GORDON:

Q. The defendant in this case is Philip Morris

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Incorporated; correct?

A. I would not be the one to ask that.

Q. Well the entity, the corporate entity, Philip Morris Incorporated does business under the trade name Philip Morris USA; correct?

A. That's my understanding.

Q. Okay. And up until the mid-1980s, Philip Morris Incorporated was the only Philip Morris entity doing business in the United States; correct?

A. I think that would be a rather complex question because there have been a number of acquisitions over time, so I -- I wouldn't necessarily be the one to ask that either or want to answer that.

Q. Well Philip Morris Incorporated is now a wholly-owned subsidiary of Philip Morris Companies; correct?

A. Yes.

Q. Okay. And Philip Morris Companies came into existence sometime in the mid-'80s shortly after Philip Morris Incorporated acquired Kraft General Foods; correct?

A. Yes.

Q. Okay. And up until that time, Philip Morris Incorporated was a publicly traded corporation; correct?

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A. Yes.

MR. FOWLER: If you know.

Q. Okay. And there was a stock swap where Philip Morris Incorporated shareholders got shares in this newly created holding company, Philip Morris Companies, in exchange for their shares in Philip Morris Incorporated; right?

A. I believe I recall that, yes.

Q. Okay. But Philip Morris Incorporated continued on as the cigarette portion of the Philip Morris business under the trade name Philip Morris USA; right?

A. I believe that's what happened.

Q. Okay. Have you --

A. Legally I'm not sure exactly what the contracts or the names meant.

Q. Okay. And when you've used the -- the -- the phrase or I have used the phrase "Philip Morris USA," you have understood that to refer to the trade name of the corporation Philip Morris Incorporated; right?

A. Not necessarily, no.

Q. Okay. What does it refer to in your mind?

A. It depends on whether or not you're talking about Philip Morris Incorporated, Philip Morris

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International or Philip Morris Companies Incorporated. Philip Morris is an entity in all of those, so just saying "Philip Morris" per se is confusing.

Q. You're confused by the phrase "Philip Morris"?

MR. FOWLER: No, no, in connection with the way you're using it in this case.

A. Right.

Q. Okay. Well I -- when I use "Philip Morris," I'm referring to Philip Morris Incorporated, the defendant in this case, --

A. Uh-huh.

Q. -- which does business under the trade name Philip Morris USA. Okay?

A. Okay.

Q. Okay. And up until 1985 it also owned and did business under the name of Philip Morris International. Okay? Do you understand that?

MR. FOWLER: Is that your understanding?

A. I would not want to speak on that because at that point in time I don't think I was at a level in the company that I would have understood or known what was going on.

Q. Okay. So you don't know?

A. I don't know.

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Q. Okay. Before your counsel asked for a break, you were in the middle of answering a question.
A. Uh-huh.
Q. Your counsel interrupted your answer to -- to take a break. Do you recall the question?
MR. FOWLER: I don't believe that's -- I don't believe that's true.
MR. GORDON: Well let's read back exactly what happened.
MR. FOWLER: And if -- if -- if that -- if I did interrupt her answer, that was inadvertent.
Did I interrupt your answer?
THE WITNESS: I don't recall. No, I thought I had already answered it.
(Discussion off the stenographic record.)
BY MR. GORDON:
Q. Okay. My question was: "You're -- your testimony is, on behalf of Philip Morris USA, that Philip Morris contends that there never was a gentlemen's agreement not to do biological research?"
Your answer was: "I didn't say that. I said I do recognize," at which point your counsel said, "Just a second, just a second." You said, "Yes." Your counsel said, "Object to the form of the

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question. It's been asked and answered.

"Let's go off the record for just a second."

Now I'd like to go back to when you started to say --

A. Uh-huh.

Q. -- "I said I do recognize."

A. Uh-huh.

Q. That's when your counsel interrupted. What did you recognize?

MR. FOWLER: Well for the record, I apologize for interrupting the -- the answer. That was not my intention, and I -- and I do apologize for that. And also for the record, I didn't talk to Dr. Ellis at the break at all concerning that question in any way, shape or form.

Now if you understand where we are, you can go back and answer the question.

A. Absolutely, and I -- I can -- I can tell you exactly what I was going to say because I still remember it. I recognize that I have read in certain documents the terms "gentlemen's agreement," and I do recognize that that term exists in certain documents.

But as I represented earlier to your question, the practice that I also recognize in the review of

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those documents and the practice that I understand indicates a long and continuous history of biological research.

Q. Okay. You --

You acknowledge that agreements can be broken; right?

MR. FOWLER: Object to the form of the question.

A. As a general sense, yes, agreements can be broken.

Q. You and I could agree right now that for the rest of the day we're not going to eat any meat products; right?

A. We could.

Q. Okay. And that would be an agreement between us; right?

A. I guess so.

Q. And I could still go out on the street corner and buy a hot dog and eat that at lunch; right?

A. You could do that.

Q. Okay. The fact that I went out and ate that hot dog at lunch wouldn't change the fact that you and I had had an agreement; right?

MR. FOWLER: Object to the form. It calls for a legal conclusion.

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A. Yeah, I'm not too sure I'm really qualified to -- to deal with contracts on hot dogs, so --
Q. Okay. I'm not talking about contracts. I'm not talking about law. I'm just talking about if you and I make an agreement we're not going to eat red meat for the rest of the day and I go out and eat a hot dog, that doesn't change the fact that you and I have an agreement, does it?
MR. FOWLER: Same objection.
A. It certainly was something that was discussed between the two of us hypothetically, potentially. If you want to term that an agreement, whether or not it's a casual agreement, a friendly agreement or a legal agreement is another issue.
Q. I -- and I -- and I appreciate that and I'm not trying to clar -- to --
A. Okay.
Q. -- to classify it in any particular type of way. I just want you to agree, if you do agree, that the fact that I go out and eat that hot dog just means that I broke our agreement, not that there never was an agreement. Right?
MR. FOWLER: Object to the form, same objection.
A. Sure. I mean, if you want to characterize

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something that's hypothetical that way, sure.
Q. Okay.
A. You can do that.
Q. And now to go back to my question about biological testing, is it Philip Morris's position that there was or was not a gentlemen's agreement not to do in-house biological testing on cigarettes by the U.S. cigarette manufacturers? Whether or not individual companies broke the agreement --
A. Uh-huh.
Q. -- the question is: Was there or was there not such a gentlemen's agreement?
MR. FOWLER: Object to the form of the question. It's been asked and answered several times.
A. I can answer only from my -- my knowledge, both based on experience and reading documents. I recognize that those terms exist in the documents. I also recognize through the documents and through my experience many years of continuous biological research.
Q. Okay. So Philip Morris agrees that there was an agreement, but -- but contends that it -- the agreement was violated?
A. I --

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MR. FOWLER: Object to the form of the question. That misstates her testimony.

A. I indicate to you that what I do agree to is that there are those words in certain documents. What they mean, I'm not sure in terms of what was agreed to between whom at the time because I was not present.

However, I can say what the practice was because I can see the documents and I have had experience in that practice.

Q. Okay.

A. That's what I'm saying.

Q. So Philip Morris today cannot take issue with what -- what is said in those documents and what the people who actually wrote those documents said about them?

MR. FOWLER: Object to the form of the question.

Q. Is that correct?

A. "Take issue," I don't know what -- what you mean by that.

Q. If Dr. Wakeham, for example, had written in -- in a document that there was a gentlemen's agreement and has testified that there was in fact an understanding among the American cigarette

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manufacturers not to do individual in-house biological testing, you today as the spokesperson for Philip Morris cannot say that that is incorrect?

MR. FOWLER: Objection to --

Q. Is that -- is that an accurate statement?

MR. FOWLER: Object to the form of the question.

A. As I indicated before, my -- I can speak only from what I know, and what I know is the words appear in documents. As I indicated before, I was not present, so therefore I cannot really speak to any kind of agreement or discussions that may have been had by people before I was involved.

Q. Okay. I just want you to understand this is my opportunity to ask Philip Morris --

A. Yes.

Q. -- what its position is on certain things.

A. Uh-huh.

Q. And I just want to make sure that there's no misunderstanding here.

A. Uh-huh.

Q. At the time of trial --

A. Uh-huh.

Q. -- Philip Morris is not going to come into the courtroom --

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A. Uh-huh.
Q. -- in front of the jury and say --
A. Uh-huh.
Q. -- there never was a gentlemen's agreement; is that correct?
MR. FOWLER: Object to the form of the question.
A. I can -- I can speak today from what I know, and what I know I've already told you. I know that those words exist in certain documents. What they mean, who discussed them, who was involved in them and what they really meant, I don't know, but I do know practically, I do know from documents, I do know from my personal experience that some of what is being said about those words, "gentlemen's agreement," just did not play out in practice.
Q. Okay. At some point Philip Morris acquired a research facility in Cologne, Germany, known as INBIFO; correct?
A. Which Philip Morris?
Q. Philip Morris Incorporated.
A. Thank you. Today or then? We're going to have some con --
Q. Then.
A. Then. I -- again I'm not too sure what the

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corporate structure was at that time. I -- I will represent that Philip -- INBIFO is and has been and always has been a FTR holding company which is a part of Philip Morris International.

Q. Okay. And when INBIFO was acquired, FTR was owned by Philip Morris Incorporated; correct?

A. I'm not sure.

Q. Okay. What would you have to do to find out?

A. I would have to go through the corporate structure and the changes, which obviously I'm not necessarily well versed on.

Q. So as you --

As you sit here today testifying as the spokesperson from Philip Morris most knowledgable about Philip Morris's research and development, you don't know whether or not Philip Morris has ever owned directly or through a subsidiary an entity known as INBIFO; is that correct?

MR. FOWLER: Just a second. Object to the form of the question. It misstates her prior testimony, and these questions have all been answered in interrogatories and so we're just replowing old ground.

A. And you just used the term "Philip Morris" again without -- you know, Philip Morris Companies

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Incorporated? Obviously, yes. Philip Morris what, International? Obviously, yes.

Whether or not there was a corporate identity and what they were at that particular time in 1970, you know, I -- I cannot attest to today and have not had personal experience on it.

MR. FOWLER: And -- and she's --

Q. I thought I said it before, but when I -- when I say "Philip Morris," I mean Philip Morris Incorporated. Okay?

A. Well --

Q. Unless we specify that it's something else, when I say "Philip Morris," it means the defendant in this case, Philip Morris Incorporated. Okay? And I agree with your counsel that this question has been answered; if not in interrogatories, it's been extensively testified to by other Philip Morris officials.

You today just don't know the ownership chain of -- of INBIFO; is that correct?

A. I do know that INBIFO was purchased as an FTR holding company as a part of Philip Morris International. What the actual changes were in those companies since that time above that level, I don't know.

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Q. Okay. And the reason INBIFO was acquired was because that was in a locale, Germany, where Philip Morris could do some of the things that Philip Morris was reluctant to do in the United States; correct?

MR. FOWLER: Object to the form of the question. It's argumentative.

A. No, it was not correct based on my knowledge. I think what is correct is that if you go through the documents and the amount of research that was being done, extensive work was being done in mouse skin painting at the time at Bio-Research Consultants. At the -- in the -- in the '60s certainly it was recognized that there was a need to do inhalation research. Many of the contract laboratories that had facilities to do this research were booked. It takes two years to do a study, and to get the facilities that were required to perform the tests that we felt needed to be done, we needed to have a facility. This institute had been formed, was operating as a contract lab and was available, and it was purchased so that we could do our studies.

Q. Let me show you what's been previously marked as Exhibit 145, a document produced by Philip Morris bearing Bates stamp number 2022244451 through 4453, a document dated April 7, 1970 from H. Wakeham to C. H.

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Goldsmith entitled "Acquisition of INBIFO."

You've seen this document before, have you not?

A. Yes, I have.

Q. Okay. And H. Wakeham is Dr. Wakeham, who was the head of research and development; right?

A. Yes.

Q. And C. H. Goldsmith is Clifford Goldsmith; correct?

A. That's correct.

Q. He was the chief executive officer of Philip Morris; is that correct?

A. At one time.

Q. Okay.

A. Whether or not it was 1970, I don't know.

Q. Okay.

MR. FOWLER: If you need a second to look through the document --

THE WITNESS: Yeah, let me.

(Witness reviews Plaintiffs' Exhibit 145.)

Q. I direct your attention to the third paragraph.

A. Uh-huh.

Q. Could you read the first sentence there, please.

A. "Since we have a major program at INBIFO, and since this is a locale where we might do some of the

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things which we are reluctant to do in this country, I recommend that we acquire INBIFO either in toto or to the extent of controlling interest."

Q. In 1970 what were some of the things that Philip Morris was reluctant to do in the United States of America?

A. I don't know.

MR. FOWLER: Object to the form.

Q. Okay.

A. And the reason I don't know is because we were doing both inhalation studies in monkeys at Hazleton and mouse skin paintings at -- at Bio-Research Consultants con -- extensively and subsequently did inhalation in hamsters and mouse skin painting with the American Health Foundation.

Q. The answer is you don't know?

A. Well the answer is, is that the practice is not consistent with this statement.

Q. Okay. I'm going to show you what's been marked -- well strike that. Was Philip --

Can Philip Morris and did Philip Morris do absolutely every single thing it has done at INBIFO in the United States?

A. In terms of the tests, we've done mouse skin painting; we've done inhalation in the United States;

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we've done many in vitro tests in Richmond. So other than very minor, maybe one or two in vitro tests that are different, most of the kinds of work that we have done at INBIFO has been done in the United States either by us internally or by external labs.

Q. Well I'm talking about internally. Has Philip Morris done internally in the United States each and every type of scientific experiment that INBIFO has done for Philip Morris?

MR. FOWLER: Object to the form as to time.

A. Yeah, we don't -- we don't have the facilities in Richmond to do inhalation tests. However, we did do in vitro tests and we did over the years -- as I've indicated, starting in the '60s we did inhalation tests with Hazleton. We've done inhalation tests and mouse skin painting tests with the American Health Foundation, and we've done mouse skin painting tests with Bio-Research Consultants for a period of at least a decade. So all of that work there was done in the United States.

Q. Same exact work?

A. Well maybe different samples were tested. In some cases the same sample was tested because we wanted to understand the differences between

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laboratories and to qualify the laboratory.

Q. Okay. But some different samples have been tested at INBIFO that have not been tested by Philip Morris in the United States; correct?

A. As I indicated earlier, the issue was the volume of work we felt that needed to get done, and we needed more facilities to do that.

Q. Okay. I show you what's been previously marked as Exhibit 279, a document produced by Philip Morris bearing Bates stamp number 2000512794 through 795, a document dated March 31st, 1977 from Robert B. Seligman to Dr. Mack Hausermann.

A. It's Max Hausermann.

Q. What did I say?

A. I think you said Matt.

Q. Oh, thank you.

You've seen this document before?

A. Yes, I have.

Q. Who was Dr. Robert B. Seligman?

A. Dr. Seligman was a former vice president of research and development.

Q. For Philip Morris?

A. Yes.

Q. Okay. Who was Max Hausermann?

A. Max Hausermann at that time may have been the

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director or vice president of research and development in Philip Morris Europe.

Q. In Neuchatel, Switzerland; right?

A. Yes.

Q. Okay. Could you read the first full paragraph of this letter, please.

A. "I received a copy of Helmut Gaisch's March 24, 1977, letter to Jerry Osmalov concerning pesticide residue analyses. As you were copied, you know that Helmut was requesting that we send samples directly to INBIFO. This suggested procedure is in direct conflict with our communications from the New York Office. We have gone to great pains to eliminate any written contact with INBIFO, and I would like to maintain this structure."

Q. Okay. Why did Philip Morris go to great pains to eliminate any written contact with INBIFO?

A. I don't understand this -- this paragraph.

Q. Okay.

A. It is not my current experience.

Q. Okay.

A. Nor has it been my -- my experience.

Q. So you don't know in 1977 why Philip Morris was going to great pains to eliminate any written contact with INBIFO?

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A. I don't know.
Q. Okay. Could you read the next paragraph, please.
A. "Therefore, I am advising Jerry Osmalov to continue sending samples to Neuchatel for" this "transshipment to INBIFO. If this procedure is unacceptable to you, perhaps we should consider a," quote, "'dummy,'" unquote, "mailing address in Koln for the receipt of samples. The written analytical data" we "still have to be" -- "will still have to be routed through FTR if we are to avoid direct contact with INBIFO and Philip Morris U.S.A. I'll leave it to you to decide what route you will follow."
Q. Okay. And FTR was a Philip Morris subsidiary; correct?
A. Again Philip Morris Incorporated at that time, I'm not sure what the actual corporate structure was.
Q. Okay. FTR was part of Philip Morris International?
A. International.
Q. Okay. And if the interrogatory answers and testimony of other individuals indicates that at that time Philip Morris Incorporated owned Philip Morris International, then you would agree that Philip

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Morris Incorporated owned FTR?

A. Then it was all part of the same.

Q. Do you know why written analytical data was being routed through FTR to avoid direct contact with INBIFO and Philip Morris USA?

A. As I indicated previously, this is not my current or past experience relative to these things.

Q. Okay. But you don't know what was happening in 1977?

A. No, I do not.

Q. Do you know if a dummy mailing address was ever established in Cologne?

A. No, I do not know.

Q. I'd like to show you what's been marked as Exhibit 91, a document -- oh, let me -- sorry, I tossed you the wrong copy.

I'm showing you Exhibit 91, a document produced from the files of Thomas Osdene by Philip Morris bearing Bates stamp number 1000130803.

You've seen this document before, have you not?

A. Yes, I have.

Q. Okay. And this is a handwritten note from Dr. Osdene; correct?

A. Yes.

Q. Who is Dr. Osdene?

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A. Well, let me back up. I'm not too sure that's indicated here, and I don't think I can verify, based on my experience, that that is true.

Q. Did you do anything to find out who wrote this?

A. Maybe it was in context of other documents. I'm not -- I'm not sure. I don't see a date either, so --

Q. What is Philip Morris's understanding of the date of this document and who wrote it?

A. I don't know. I'd have to go back into the files and see what -- where it came from.

Q. Okay. It's been represented to us by Philip Morris that it came from the files of Dr. Thomas S. Osdene. Do you know who that is?

A. Yes, I do.

Q. Okay. Who --

Who is that?

A. Dr. Osdene was a former director of research in R&D and subsequent vice president of science and technology.

Q. For Philip Morris?

A. For Philip Morris.

Q. Okay. And what does the first line on this Exhibit 91 say?

A. Skip all -- no, I'm sorry.

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"Ship all documents to Cologne by Tom," I think.

Q. Is that --

Do you know if that refers to tomorrow or a person named Tom?

A. I certainly don't know.

Q. Okay. And what's the next line say?

A. "Keep in Cologne."

Q. What does the next line say?

A. "OK to phone and telex (these will be destroyed)."

Q. Do you know what was destroyed?

A. No, I do not.

Q. Okay.

A. I don't know if anything was destroyed.

Q. Do you know which documents were shipped to Cologne?

A. No, I do not. I do understand there is a file cabinet in Cologne that does contain the reports that were sent to Richmond on all the studies and they were shipped back, and if that's what this refers to, that's what this refers to. I don't know that.

Q. Okay. And you understand that Philip Morris was under an obligation to have produced a list of those documents by court order two days ago; correct?

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MR. FOWLER: If you know.

A. I certainly don't know that.

Q. Okay. Do you know that the person -- the lawyer responsible for that was -- or strike that.

We were told that the lawyer responsible for providing that list of documents in response to the court order was robbed in Richmond, including her notes, and we were told we would have that list by noon tomorrow -- or excuse me, noon yesterday. Did you know that?

A. No, I did not know that.

Q. Okay. Do you have any knowledge as to where the list of documents that are in that file cabinet is?

A. I have no knowledge that that happened at all.

Q. Okay. Well could you read point number six on Exhibit 91, please.

A. "If important letters," I think it says, "or documents have to be sent, please send to home. I will act on them and destroy."

Q. Do you know what important letters or documents were sent to this person's home which were acted on and destroyed?

MR. FOWLER: Object to the form.

A. I have no way of knowing that or if it happened.

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Q. Okay. Have you familiarized -- familiarized yourself with research and development expenditures by Philip Morris?

A. To a certain degree, yes.

Q. Have you had a chance to compare those research and development figures to the money that Philip Morris has spent on advertising, marketing and promoting its products?

A. I do understand some of the -- the relative budgets in the different areas in Philip Morris, yes.

Q. Okay. I'm going to show you what's been previously marked as Plaintiffs' Exhibit 602. I represent to you that this is a black-and-white photocopy of a -- of a color exhibit. Apparently the court reporter also only has a black-and-white copy today, and I'm going to direct your attention -- this -- this is an expert report prepared at the request of the plaintiffs in this case.

And I'm -- you certainly feel free to look at the whole document if you wish, but I'm going to just flip you to the one page I want to show you and ask you questions about. If you want to look at it, the rest of it, feel free.

MR. FOWLER: Just flip through it just to

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get a feel for it.

(Witness reviews Plaintiffs' Exhibit 602.)

MR. FOWLER: There are a couple of blank pages --

THE WITNESS: Yes.

MR. FOWLER: -- in there. Do you know what that's all about?

MR. GORDON: No. It could be photocopying. We could ask -- if you need to see it, we can ask for the court reporter to produce -- you know, to bring out the -- the court reporter's copy. I'm only going to ask questions about that -- that one page, but if you want to see the whole thing --

MR. FOWLER: It's not necessary unless it becomes evident that it is during the questioning.

MR. GORDON: Fine.

MR. FOWLER: Oh, I see, I think that that just means that's starting section B.

THE WITNESS: B.

(Witness continues reviewing Plaintiffs' Exhibit 602.)

BY MR. GORDON:

Q. Do you have that one page that I was directing you to?

A. I believe this is the page.

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Q. Okay. And that's --
A. If you want to --
Q. Right, that's the one.
A. Okay.
Q. And that's a pie chart that compares the expenditures of Philip Morris for research and development versus marketing, advertising and promotion for the years 1969 to 1994; correct?
A. That's what it says.
Q. Right. And you can see that the slice of pie in the black there is what represents research and development expenditures and the rest of the pie in white is what -- what Philip Morris spent on advertising, marketing and promotion during that same period of time; correct?
A. That's what it says. I would have to understand where the numbers came from because obviously I have two issues. Number one is it is my understanding that over the years much of research and development was not classified as such, so without knowing where the figures came from, it would be very difficult to, you know, really ascertain whether these are correct or representative figures.
Q. Well I will represent to you that these are based on figures provided to us in discovery by

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Philip Morris in this case, and my question is: Do you have any basis for disputing the comparative representation of R&D expenditures versus what Philip Morris spent to advertise, market and promote its cigarettes?

MR. FOWLER: Object to the form. I think she just explained some of that, but go ahead and answer the question.

A. Yeah, I -- because I personally do not know where the numbers came from, nor do I know that they're represented in an interrogatory, I -- it would be very difficult for me to ascertain the correctness of these relationships.

Q. And you did nothing to find out or to prepare yourself to be able to answer that question today; is that correct?

A. In terms of relating to marketing and advertising and promotion, no.

MR. FOWLER: Nor was it clear from the 30.02(f) designation that questions of this variety would be asked.

MR. GORDON: Okay. Let's take a break.

THE REPORTER: Off the record, please.

(Recess taken.)

BY MR. GORDON:

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Q. Dr. Ellis, I want to shift our discussion now to nicotine. You -- you understand you're also here testifying as the person most knowledgable -- knowledgable on behalf of Philip Morris on issues related to nicotine; correct?

A. Yes.

Q. Okay. Nicotine is in every single cigarette that Philip Morris sells today; correct?

A. Yes.

Q. Okay. And except for a brief period of time when Philip Morris test marketed a denicotinized cigarette, every single cigarette Philip Morris has ever sold has contained nicotine; correct?

MR. FOWLER: Object to the form.

A. The denic product also contained nicotine, so to that degree, all cigarettes commercially sold did contain nicotine.

Q. The denicotin -- denicotinized cigarette had a tiny amount of nicotine; correct?

A. In the filler, yes.

Q. Do you know how much?

A. Well I think we were able to reduce nicotine by somewhere between 95 and 98 percent depending on the conditions of the extraction.

Q. Currently the lowest amount of nicotine in a

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Philip Morris cigarette under the FTC method is .1 milligrams; is that correct?

A. That's my understanding, yes.

Q. How --

How did the denicotinized cigarette compare to that?

A. Very close, .08, as I recall.

Q. And the .08 product failed in the marketplace; correct?

A. It was not subjectively acceptable to consumers.

Q. Okay. But the .1-milligram cigarette is -- is succeeding in the marketplace?

A. It is still in the marketplace, yes, and is being sold.

Q. Okay. And Philip Morris did a series of EEG studies over the years to measure, among other things, the effects of nicotine on the central nervous system; correct?

MR. FOWLER: Object to the form.

A. Philip Morris did a -- a number of EEG studies over the years. The characterization of effects on the central nervous system I think are -- is a bit broad given the context of some of the limits of the study.

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Q. Well one of the things that the EEG tests were studying was certain aspects of nicotine's effects on the central nervous system; right?

MR. FOWLER: Object to the form.

A. The EEG measures certain electrical waves in the brain and sometimes things that affect other parts of the body. For example, just moving your arm will affect the EEG patterns, so it is a very general and nondescript type of response.

Q. Well there's a specific test called the pattern revoked -- pattern-reversal evoked potential; correct?

A. That is a specific test, yes.

Q. The PREP; correct?

A. PREP, yes.

Q. And that's basically some sort of a pattern is exhibited in front of a subject and it's moved or reversed in -- in some way that the pattern changes before their eyes, and then an electrical activity is measured in the brain at the moment that that pattern is reversed; correct?

A. There is a checkerboard pattern on a TV screen and there are white blocks and dark blocks, and basically what happens is you elicit a response when that pattern reverses, so the white blocks become

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dark and the dark blocks become white. And that then evokes a potential because you have a sensory response, a visual response, to that change in pattern.

Q. Okay. And that's a -- a blip on a -- on a -- on a graph like a earthquake seismograph-type machine; right?

MR. FOWLER: Object to the form.

A. Actually technically it's more complex than that because the EEG wave patterns, they are very complex and there's a lot of noise, and what happens is that you have to have a computer basically sum those patterns and look at the actual evoked potential at the time frame that the pattern changed. So it's not just a single wave when you initially get the data.

Q. And you look at how high the pattern goes or how low the pattern goes and how long it stays elevated or lowered; right?

A. Well evoked potentials, no matter what they are, do have characteristic patterns to them. They have positive waves and negative waves, and those are reversed in the context of EEG.

Q. Okay. And Philip Morris determined through a series of EEG studies that nicotine administered to a human being affects certain specific patterns on

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these evoked potentials for the PREP test; right?

MR. FOWLER: Object to the form.

A. Yeah, I think we did some -- did some studies with a number of different compounds and -- and found some different changes in different patterns associated with those waveforms. It wasn't just nicotine. We did -- we did a number of studies with different flavorants. We also did studies with caffeine.

Q. My specific question relates to nicotine.

A. Uh-huh.

Q. Philip Morris determined that nicotine has certain characteristic effects on the PREP measure on the electroencephalogram; right?

A. I have to disagree with your phrase "characteristic." They aren't characteristic just to nicotine. As I indicated, we did do other studies with other materials and saw similar effects.

Q. Whether you did or you didn't, I don't want to know about other effects. I want to know did you or did you not determine that nicotine administered to human beings affects the PREP measure on EEGs.

A. We did see that in the context of some smoking experiments. Whether or not it was specifically nicotine is not able to be determined precisely from

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the context of the experiment, and how nicotine may have affected it or how the cigarette may have affected those PREPs is not able to be determined per se.

MR. FOWLER: Dr. Ellis, you'll have to slow down so I can interpose objections --

THE WITNESS: Okay.

MR. FOWLER: -- when appropriate.

THE WITNESS: Okay.

Q. In fact, cigarettes of different nicotine deliveries affect the pattern-reversed evoked potential; right?

A. Are you referring to a specific study in a specific document? There -- I believe that does exist in our documents, yes.

Q. I'm referring to a series of studies that have been conducted over a number of years under the guidance of Dr. Frank Gullotta.

A. Yes.

Q. Okay. And throughout all these studies that Dr. Gullotta did as an employee of Philip Morris, the underlying premise was that nicotine levels affect the PREP?

MR. FOWLER: Object to the form of the question.

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A. I disagree with your characterization of his studies over the years.

Q. Was it --

A. I -- as I indicated, there were multiple studies. PREPs were only a portion of those. Many other compounds were tested, and they produced similar effects to those that were seen in nicotine in some cases.

Q. Okay. Is it your testimony that Dr. Gullotta was not able to differentiate nicotine effects from other effects on the PREP in the EEG?

A. Number one, when you -- when you increase nicotine in cigarette smoke, you are getting a sensory response. There is potential that the sensory aspects of that particular product did impact that study. We've done multiple experiments with olfactory agents and in the olfactometer. There are changes to EEG waves with amplitude with the olfactory agents, and caffeine produced similar P1 latency decreases as nicotine.

So what I'm trying to represent here is that nicotine was not unique, that many different tests were done.

Q. You said it affected the P1 latency. How'd it affect the N1 amplitude, caffeine, same way as

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nicotine?

A. No, caffeine had other -- also, I think, affected the N1 amplitude.

Q. Same way as nicotine; that's your testimony?

A. Pardon me?

Q. Are you --

Is it your testimony that caffeine and nicotine have the same impact on the -- both the P1 amplitude -- P1 latency and the N1 amplitude?

A. No, it's not my testimony. Caffeine actually did more than nicotine.

Q. Whether it did more or less, nicotine had a characteristic effect on P1 and N1; right?

MR. FOWLER: Object to the form, asked and answered.

A. No, I disagree with your term "characteristic." It was not characteristic. You could get other agents like caffeine to produce a similar effect.

Q. Do you know who Dr. Jim Charles is?

A. Yes.

Q. Who was he?

A. He was the director of research.

Q. And he supervised Frank Gullotta in these EEG experiments, didn't he?

A. Yes, and so did I.

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Q. Would you agree that Dr. Charles knows -- knows something about the EEG experiments that Dr. Gullotta did?

MR. FOWLER: Object to the form.

A. Yes.

Q. Would you --

Would you defer to Dr. Charles's understanding of what those tests involved and what they meant?

A. No.

Q. You wouldn't?

A. No.

Q. You know better than Dr. Charles?

A. I --

MR. FOWLER: Object to the form of the question.

A. I certainly supervised Dr. Gullotta's work closer and more recently than Dr. Charles did.

Q. How many EEG studies did Dr. Gullotta do using nicotine?

A. I would not even want to guess in terms of quantitatively. I would say that they were relatively few compared to the other studies he was doing.

Q. Okay. Is it your testimony that the studies he did with nicotine are meaningless because it may or

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may not have had anything to do with what nicotine was actually doing?

MR. FOWLER: Object to the form. That question's argumentative.

A. What I'm trying to say is that in a cigarette that is very complex, you're looking at more than one thing. That's number one. Number two, I'm trying to say that EEG changes are characteristic of everything that we do, whether they're visual or -- or -- excuse me, visual or auditory -- auditory or olfactory evoked potentials. Everything we do, even sensory responses, would be recorded and have an impact on the EEG; therefore, you cannot say it's characteristic.

A cigarette is very complex. The measurement you were talking about here is very complex, and much of Dr. Gullotta's work was focused on looking at subjective effects of different flavorants.

Q. Isn't it a fact, Dr. Ellis, that Dr. Gullotta determined that a minimum of .1 milligrams of nicotine was necessary in order to have brain effects?

A. I disagree with the characterization of that work. I think that it could be that Dr. Gullotta in the context of his experiment perhaps -- and again

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there was some issues with, my understanding, the actual cigarettes at hand, but Dr. Gullotta found that those cigarettes would produce perhaps a sensory effect at that par -- particular level and sensory effects can influence the EEG, as I've already indicated.

Q. Is it not true that Dr. Gullotta determined that there were optimal cigarette nicotine deliveries to produce the most favorable physiological and behavioral responses?

A. There's no question that Dr. Gullotta had a number of statements in his documents. Any R&D scientist, you know, is expected to be creative and innovative and look at a variety of different hypotheses in the context of their studies.

Q. And Dr. Gullotta also demonstrated that not all forms of nicotine are physiologically equal; right?

MR. FOWLER: Object to the form of the question.

A. Again I would have to understand what Dr. Gullotta specifically meant relative to all forms of nicotine.

Q. Okay. Let me show you what's been marked as Exhibit 102, a document produced by Philip Morris bearing Bates stamp number 2028813366 through 3368, a

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memorandum dated November 8, 1990 from Dr. Gullotta, C. S. Hayes and B. R. Martin to you; correct?

A. Yes.

Q. Okay. And what's the subject of this?

A. Raison d'etre.

Q. Reason for being; right?

A. Precisely.

Q. Okay. And this was --

Well first of all, who was Hayes and Martin?

A. They worked in the laboratory with Dr. Gullotta.

Q. Okay. So these three people were giving you this mess -- this memo to explain the reason for the existence of their group; right?

A. Yes.

Q. Okay. And what does number four say on this?

A. Number four says "Our laboratory has demonstrated that all forms of nicotine are not behaviorally or physiologically equal. This observation is important for evaluating research cigarettes where the addition of nicotine is necessary."

Q. Okay. What did you understand that to mean when you got this memo?

A. What that means is that he found that upon

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addition of nicotine to different cigarettes, he was finding that he was getting different responses in his experiments, and therefore you had to control for the various ways you were putting the cigarettes together for these experiments.

Q. What did you understand him to mean when he used the phrase "form of nicotine" in this memo?

A. It's very general. I don't know. It could have been any number of aspects. It could be isomers, and he did do some work in that area. It could have been the salt form of nicotine because he did add salt forms of nicotine, so it could have been any -- any one of those.

Q. Nicotine can exist as a salt form; correct?

A. Yes.

Q. It can also exist as a free base form; correct?

MR. FOWLER: Object to the form of the question.

A. I -- I would not characterize it as a free base. I think technically speaking "nonprotonated" is a more accurate term.

Q. Okay. And others use the term "free base" to refer to unprotonated nicotine, do they not?

A. Some I've -- I've certainly heard that and seen that, yes.

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Q. Okay. Well in fact that's what Dr. Gullotta referred to it as when he did certain studies involving the addition of nicotine as a base versus -- as a free base versus nicotine as a salt form; correct?

A. Yes, and it's a very complicated situation because when you add nicotine to tobacco, nicotine would form the salt because of the pH of tobacco.

Q. Okay. And he determined, did he not, that if you add nicotine as a salt, you get about half the brain effects as measured by EEG as if you add the same amount of nicotine in its free base form? Right?

MR. FOWLER: Object to the form.

A. If you look at those studies, he added nicotine as a nicotine citrate. Citrate is well known in sensory studies to have negative subjective effects. This is a very complex situation and this is not a situation where you were looking just at nicotine. There are multiple factors here.

Q. I show you what's been marked as Exhibit 105, a document produced by Philip Morris bearing Bates stamp number 2028817237 through 7241, a memo from Gullotta, Hayes and Martin to H. L. Spielberg dated August 2, 1989, "Subject: When Nicotine is not

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Source: http://www.industrydocuments.ucsf.edu/docs/kkxd0001

Nicotine."

Who's H. Spielberg?

A. Howard Spielberg was the -- was the tech -- product development fellow, I believe, at that period of time. I'm not sure exactly where he was, but he ended up being the product development fellow.

Q. Okay. And you were copied on this memo, were you not?

A. Yes.

Q. Okay. Direct your attention to page four, the last paragraph where it starts "In summary." Could you read that paragraph, please.

A. "In summary, the results of the current study demonstrate that cigarettes made from filler oversprayed with nicotine as the base (FB)," in parentheses, "produced CNS effects comparable to those obtained with unextracted cigarettes with similar mainstream nicotine deliveries. Cigarettes made from filler oversprayed with nicotine as the citrate (NC)," in parentheses, "produce CNS effects which are approximately half the magnitude of those obtained with the free base" -- well it says "FB" -- "or unextracted cigarettes - at comparable nicotine delivery levels. These data indicate that we should conduct Phase I ART studies using cigarettes made

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from filler oversprayed with a nicotine as" a "base" -- "as the base."

Q. So nicotine delivered as a citrate -- nicotine citrate produced half the CNS effects, central nervous system effects, as nicotine -- as the same amount of nicotine delivered as the free base; right?

MR. FOWLER: Object to the form of the question, --

A. You know, it's -- it's --

MR. FOWLER: -- misreads the document.

A. I think it's very interesting that you should bring this paragraph up because what this paragraph says to me is that given equal nicotine delivery, you see different CNS effects, which means to me this is much more complex than just the nicotine that's delivered, and I point your attention to the presence of the citrate.

Q. Philip Morris has known for over 30 years that the higher the pH, the higher the nicotine delivery of a cigarette; right?

MR. FOWLER: Object to the form of the question.

A. Within commercial cigarettes, which are pretty much at a -- a very similar pH, around 6 in the

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filler and maybe about 6.3, 6.5 in the smoke or even less than that actually in certain -- certain cigarettes, there is -- the -- the -- the tobacco filler and the smoke is on the acidic side. And I'm going to have to ask what the original question was to make sure I'm responsive to you.

Q. Okay. Philip Morris has known for more than three decades, has it not, that nicotine delivery varies with the filler pH?

A. Philip Morris --

MR. FOWLER: Object to the form.

A. Philip Morris has known for quite some time that the heat of combustion is sufficient to deliver the nicotine no matter what form it might be in, and that form happens to be the salt form predominantly in the tobacco filler.

Q. Move to strike as nonresponsive.

Dr. Ellis, for more than 30 years Philip has known -- Philip Morris has known that nicotine delivery varies with filler pH; correct?

MR. FOWLER: Object to the form of the question.

A. In commercial cigarettes, nicotine delivery is dependent on the heat of combustion. We have done studies that show that nicotine is evolved at -- with

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nonprotonated nicotine at about 175 degrees and with the salt form of nicotine about at 225 degrees centigrade.

The heat of combustion in a cigarette is 8 to 900 degrees. The heat of combustion in the cigarette is far sufficient to release all of the nicotine in the cigarette no matter what its form.

Q. Move to strike as nonresponsive.

I'm going to show you what's been marked as Exhibit 1506, a document produced by Philip Morris bearing Bates stamp number 2024841612 through 1617, a document dated March 31st, 1966 from L. F. Meyer to Dr. -- to Mr. R. N. Thomson entitled "Progress Report - Nicotine and Smoke pH."

MR. FOWLER: Can you read this copy?

THE WITNESS: It's very difficult to read, but I'll do the best job I can.

Q. Do you see under "Discussion" there there are three points?

MR. FOWLER: Take a moment if you need to read the introduction.

A. Well there may be two sets of three points under "Discussion," but I can't read it because of a large dark area.

Q. Okay. It's the first --

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A. First set.
Q. -- set. Just read number two, please.
A. Just a second.
Number two, "Nicotine delivery varies with filler" -- and I believe in parentheses it says "(smoke) pH - the higher the pH the higher the nicotine delivery and vice versa."
Q. Could you read the first conclusion.
A. The first conclusion, "Nicotine delivery can be controlled via filler or smoke pH adjustment."
Q. What's the date of this memo?
A. March 31, 19, I think, 66.
Q. That's over 30 years ago, is it not?
A. It was over 30 years ago, and two points need to be made on this memo. Number one, Leo Meyer himself has done subsequent work and has come to the conclusion and realization that if you look at the materials that he's been adding to these cigarettes, he has actually changed the number of puffs that you get because he's changed the burn of the cigarette. In that context, you certainly will change the tar. Also, nicotine follows tar.
Q. Okay. Move to strike as nonresponsive. Dr. Ellis, your attorney will have an opportunity to ask you questions. I'd -- in the interest of time in

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particular, I'd appreciate if you just answer my questions.

MR. GORDON: I'm going to have the court reporter mark this document as the next in sequence.

MR. FOWLER: And you can go ahead and answer the questions to the extent that you feel is necessary to accurately respond, and you know that, don't you?

THE WITNESS: Yes.

(Plaintiffs' Exhibit 1321 was marked for identification.)

BY MR. GORDON:

Q. Showing you what's been marked as Exhibit 1321, a document produced by Philip Morris bearing Bates stamp number 2056130247 through 0285, a document dated March 15, 1984 entitled "PYROLYSIS OF TOBACCO: I: ENHANCED DELIVERY OF TOBACCO FLAVOR COMPONENTS WITH AMMONIA."

You've seen this document quite recently, have you not?

A. Yes.

Q. In fact, it's one of the 18 documents you yourself identified recently in a supplemental expert disclosure indicating it's a document that you're relying on for your opinions; correct?

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A. I would have to specifically look at the list to verify that, but --

Q. This is a 1984 study; right?

A. Yes.

Q. 18 years after that 1966 document we just talked about; right?

A. I believe the math is correct.

Q. And this is a document that you yourself are relying on; correct?

A. Absolutely.

Q. Okay.

A. I think.

Q. And I direct your attention --

A. If it's on the list.

Q. I direct your attention to page eight. Do you see Table 2 there?

A. Table 2, yes.

Q. Okay. And what does it say? What is the title of that table?

A. "EFFECT OF AMMONIA AND BASE TREATMENT ON NICOTINE" -- excuse me, "NICOTINE DELIVERY AT 145 DEGREES CENTIGRADE."

Q. Okay. And the first treatment on there is what substance?

A. Water.

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Q. Okay. And what percent of total alkaloids are delivered with a water treatment?

A. 7.4 percent.

Q. Okay. Alkaloids refers to nicotine; correct?

MR. FOWLER: Object to the form.

A. And other alkaloids in tobacco.

Q. Okay. What percentage of other alkaloids are there in tobacco other than nicotine?

A. Well nicotine is the major alkaloid in tobacco.

Q. Major to what extent? What percent of the alkaloids in --

A. Oh, probably over 90 percent.

Q. Okay. So over 90 percent of what is referred to there when you talk about alkaloids is nicotine; right?

A. Yes.

Q. Okay. And with a water treatment, you get 7.4 percent of the alkaloids; right?

A. Under the conditions of this experiment, yes.

Q. Okay. And the third treatment there, what is that?

A. DAP, D-A-P.

Q. What does that refer to?

A. Diammonium phosphate.

Q. Okay. That's an ammonia compound; correct?

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A. It contains ammonia.
Q. Okay. What percent of total alkaloids do you get when you treat the tobacco with diammonium phosphate?
A. It reads 28.8 percent.
Q. That's roughly four times the amount you get if you just treat it with water; right?
A. Under the conditions of this experiment.
Q. Okay. And direct your attention, if you would, now to Table 3. I guess it appears on what would be page 11. Oh, yeah, it is -- it is numbered 11. Do you see that?
A. Yes.
Q. And what's the title of that table?
A. "AMMONIA ENHANCEMENT VERSUS FRACTION."
Q. Okay. And what is section B titled?
A. "TOTAL NICOTINE RESPONSE PER FRACTION."
Q. Okay. And it refers to a bright control. What does that refer to?
A. Bright tobacco.
Q. Okay. That's a particular type of tobacco?
A. Correct. It's flue-cured tobacco.
Q. Okay. And a control means that's the -- the one you're measuring it against; right?
A. It's -- yes, it is the control for the

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experiment.
Q. Okay. And what's the next line under that?
A. It says "BRIGHT WITH NH3."
Q. NH3 is ammonia; right?
A. Yes.
Q. So what Chart B is referring to is the comparison of total nicotine from a cigarette with a bright con -- with just bright tobacco in it versus a cigarette with bright tobacco treated with ammonia; correct?
A. Absolutely not.
Q. No? What --
A. This is not done in cigarettes.
Q. What is this done in?
A. This was a pyrolysis study, as indicated, and none of this work, that I know of, was ever done in cigarettes.
Q. It was done in tobacco?
A. It's done in -- in tobacco under conditions of pyrolysis at 145 degrees, which is not the condition of a cigarette.
Q. There's no point in a cigarette where it reaches 145 degrees?
A. It -- there is a point in a cigarette obviously where it reaches 145 degrees, but under those

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temperature conditions you're going to have much more of an impact of various items because the heat of combustion isn't the degree it is in the cigarette, and this is a pyrolysis experiment, not a cigarette experiment. You can demonstrate anything you want in a pyrolysis tube depending on your conditions, and this certainly was demonstrated.

Q. So this is a waste of time to do this experiment because it has nothing to do with cigarettes; is that your testimony?

MR. FOWLER: Object to the form of the question. It's argumentative, misstates her testimony.

A. Absolutely not. I think that the importance of this is to put forth the documents for what they are and to put forth the fact that ammonia was being looked at relative to its flavor properties, and I think that is a very important point. It has nothing to do with nicotine delivery and phys -- physically can't have anything to do with nicotine delivery.

Q. Okay. In this test bright tobacco was pyrolyzed at 145 degrees and bright tobacco treated with ammonia was pyrolyzed at 145 degrees; correct?

A. Correct.

Q. Okay. And in the first fraction, the bright

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control, the untreated tobacco, at 145 degrees gave off 429 units of nicotine; right?

A. I'm not sure. Actually in this particular experiment here it says 210 degrees, so --

Q. I'm sorry.

A. -- this was a different -- different table.

Q. Okay. This is the 210-degree one.

A. Right.

Q. Okay?

A. Right.

Q. And at 210 degrees that bright control gave off in the first fraction 429 units of nicotine; correct?

A. It says "TOTAL COUNTS." I'm not too sure. I'd have to go back and look at what that meant in terms of it may have been radioactivity counts, so --

Q. Okay.

A. -- I'd have to relook at that.

Q. Okay. What happened to the -- to the bright that was treated with ammonia? What was the count on that one?

A. It reads 8,578 --

Q. 20 --

A. -- in Fraction I.

Q. Right. 20 times as much as the bright tobacco

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without ammonia; right?

A. And if you look at the elapsed time, it's indicating, too, that there are at least five minutes of air that are being -- that is being swept through this process, and that would have an impact on -- on this process anyway. This is in no way representative of the condition of a cigarette.

MR. FOWLER: For accuracy, we should identify what's being counted.

MR. GORDON: You can do that on your examination, Counsel.

MR. FOWLER: You don't care?

Q. On Exhibit II --

MR. GORDON: Move to strike your comment.

Q. On -- on --

On Fraction II, that's an elapsed time of ten minutes; right?

A. That's what it indicates.

Q. And the bright control gave off 252 units for the nicotine?

MR. FOWLER: I'm going to object to this whole line of questioning as being meaningless given we don't know what we're talking about.

MR. GORDON: Move to strike that as a prompting objection and ask that counsel not make any

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more of those or we're going to call Judge Fitzpatrick.

MR. FOWLER: Well my intention wasn't to prompt the witness, just to prompt you to identify what we're talking about or allow the witness to.

MR. GORDON: That's not a valid basis for making an objection. You can make an objection for the record. I think your objection is meaningless, so you've made that objection.

MR. FOWLER: So was your examination on these points.

MR. GORDON: No, I believe I was characterizing what your objection was. Your objection was, quote, "meaningless."

MR. FOWLER: And that's what I'm saying your examination at this point is, quote, "meaningless."

MR. GORDON: You made that point, Counsel. Your objection is noted. Thank you.

BY MR. GORDON:

Q. At ten minutes bright control nicotine response was 252, was it not?

A. That's what Table 3, Section B, Number II, Fraction Number II, says, 252.

Q. And what --

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What was the nicotine response of the bright tobacco treated with ammonia at ten minutes?

MR. FOWLER: Object to the form.

A. The -- the total counts, whatever that may mean -- and I am busily here trying to go back and refresh my memory on that. The total counts, which is a meaningless number right now, indicates 33,664.

Q. And it's --

The ratio of the ammonia to the non-ammonia listed there is 133; right?

MR. FOWLER: You're -- Doctor, if you're confused as to what questions you're answering, feel free to look through the document so that you can --

A. Yeah, I would like to understand what the counts are, if you could give me a second.

(Witness reviews Plaintiffs' Exhibit 1321.)

A. Interestingly enough, this document does not or I cannot given this period of time find in the materials and methods what is meant by the counts, and based on the methodology, I would have to assume that those are integrator counts and they would be a nondescript unit of peak area on a integrator attached to a GC FTIR.

Q. Okay. Assuming that to be the case, at ten

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minutes the ratio of that peak count for the tobacco treated with ammonia was 133 times higher than the tobacco that wasn't treated with ammonia; correct?

MR. FOWLER: Object to the form.

A. The ratio of the one tobacco to the other under the conditions of these experiments is 133.

Q. Okay.

MR. GORDON: Can I have the court reporter mark this, please.

MR. FOWLER: Is this it here?

MR. GORDON: Yeah.

MR. FOWLER: Thank you.

(Plaintiffs' Exhibit 1322 was marked for identification.)

BY MR. GORDON:

Q. Showing you what's been marked as Exhibit 1322, a single-page document -- two-page document produced by Philip Morris bearing Bates number 2028813482, a memorandum dated February 5, 1992 from F. P. Gullotta to R. D. Kinser, direct your attention to point number two on this.

First of all, this is a list of accomplishments for 1991 for Project 1620; correct?

A. Correct.

Q. What's Project 1620?

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A. It was electrophysiological studies.
Q. EEGs?
A. EEGs, yes.
Q. And there are ten different things listed on this document; correct?
A. Yes.
Q. What was number two?
A. Number two, you want me to read it?
Q. Yes.
A. Okay. "Designed and had cigarettes prepared from filler to which acids and bases had" -- "had been applied. Demonstrated a systematic relationship between increases in filler pH and increases in gas phase (presumably unprotonated) nicotine."
Q. Okay.

MR. GORDON: Can I have the court reporter mark this.

MR. FOWLER: Thank you. I'm sorry, that was 1322? This is 1323?

THE REPORTER: Yes.

MR. FOWLER: Thank you.

(Plaintiffs' Exhibit 1323 was marked for identification.)

BY MR. GORDON:
Q. Showing you what's been marked as Exhibit 1323,

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a document produced by Philip Morris bearing Bates number 2047348173 through 8178, a memorandum date -- dated October 30th, 1991 from D. C. Watson to a distribution list which I believe appears on page --

A. Two.

Q. -- two, and it includes you, does it not?

A. Yes, it does.

Q. Okay. And direct your attention in particular to the paragraph entitled "Summary."

A. Uh-huh.

MR. FOWLER: Before you start, do we know whose underscoring this is on this document?

MR. GORDON: No. You produced it, Counsel.

MR. FOWLER: I'm just asking whether you know whether anybody at your place may have underscored this.

MR. GORDON: I assure you no one at my place touched it.

MR. FOWLER: Okay.

BY MR. GORDON:

Q. Do you see the summary?

A. Yes.

Q. And could you read the second sentence, please.

A. Starting with "Treatment"?

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Q. Right.

A. Okay. "Treatment of the" cigarettes "with gaseous ammonia resulted in increased deliveries of both vapor phase and particulate phase nicotine. Smoking cigarettes" -- you want me to go -- just that sentence?

Q. Yeah, just that sentence. Let's go back. What --

What does the phrase "increased deliveries" mean?

A. The phrase "increased deliveries" results with the actual context of this experiment, which was a -- what we call a denuder tube experiment, and in the context of this study a variety of manipulations were put forth relative to the cigarette and to the analysis and extremely high levels of ammonia were added in certain conditions. I draw your attention to page four, Bates stamped 2047348176, where you can see in item number 16 five percent ammonia, which would in itself result in physical changes to the tobacco.

And in the context of this treatment, it is totally outside the treatment level of a commercial cigarette, number one. Number two, you would have physical breakdown of the tobacco, and number three,

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it would have severe sensory consequences that would be very well noticed by the consumer.

Q. Move to strike as nonresponsive. The --

MR. FOWLER: It's completely responsive.

MR. GORDON: Counsel, please stop ruling on my objections. You're not Judge Fitzpatrick.

Q. Dr. Ellis, the phrase "increased deliveries of both vapor phase and particulate phase nicotine" means the cigarette gave off more nicotine; yes or no?

MR. FOWLER: Object to the form.

A. What it -- what it means is that under conditions of this particular experiment, it could have resulted in artificial yields of nicotine and tar, and the puff count is not even indicated here. This is not within the normal realm of a commercial cigarette.

Q. Move to strike as nonresponsive.

Dr. Ellis, can you say yes or no whether the phrase "increased deliveries" means more nicotine?

MR. FOWLER: Object to the form.

A. Not necessarily.

Q. You don't know whether "increased deliveries" means more?

A. Increased deliveries of what? I mean, increased

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deliveries --

Q. Both vapor phase and particulate phase nicotine. That's the phrase, "increased deliveries of both vapor phase and particulate phase nicotine." Does that or does that not mean more nicotine?

MR. FOWLER: Object.

A. And if --

MR. FOWLER: Object to the form of the question.

A. If the puff count of the cigarette changes and if you break down the tobacco, you're going to have more of the tobacco burned in these conditions.

Q. Move to strike as nonresponsive.

Does the phrase "increased deliveries of both vapor phase and particulate phase nicotine" mean more nicotine?

A. Under the conditions --

MR. FOWLER: Objection to form.

A. -- of this experiment, yes.

Q. Okay. Philip --

MR. GORDON: I guess we're going to have to move into Category II, so we need to do a separate tape.

THE REPORTER: Off the record, please.

(Category II deposition commenced and will

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be bound under separate cover labeled "Volume II-A.")

(Plaintiffs' Exhibits 1326 and 1327 were marked for identification.)

BY MR. GORDON:

Q. Dr. Ellis, I show you Exhibits 1326 and 1327. They are sequentially numbered documents. The first is 205 -- 2025988909 through 8912. The second is 8913 through 8914. That is a letter dated November 15, 1994 from Wolf Reininghaus to you with an attachment, a two-page appendix, and that's 1327.

You've seen these before, have you not?

A. Yes.

Q. And you had actually requested this information from Dr. Reininghaus in response to the public charges that Philip Morris was manipulating its cigarettes by pH adjustment; correct?

A. Yes, I recall that at the time.

Q. Okay. And Dr. Reininghaus at the time was director of INBIFO; correct?

A. General manager of INBIFO.

Q. Okay. And he was sending this letter to you to give you information as to how pH affected the bioavailability of nicotine, if at all; correct?

A. He was certainly discussing some of the aspects

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of the physiological aspects especially of the situation.

Q. Okay. And why did -- and -- strike that.

The reason you asked Dr. Reininghaus was because he and his scientists had studied this issue; correct?

A. The reason I asked Dr. Reininghaus is because he and his scientists are experts at inhalation and physics associated with inhalation.

Q. Okay. And let me direct your attention now to the third line of the first page of -- of the letter. Do you see where it says "The parameters expected to influence the" bioability -- "bioavailability of nicotine are as follows"? Do you see that?

A. Yes.

Q. Okay. And he lists a number of different factors -- or excuse me, a number of different parameters that are expected to influence the bioavailability of nicotine; correct?

A. Yes.

Q. Okay. Under one, "Smoke production," the third factor is "nicotine phase distribution." Do you see that?

A. Yes.

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Q. What is nicotine phase distribution?
A. Nicotine phase distribution would be the ratio of nicotine in the gas phase to the particulate phase.
Q. Okay. Now so one of the fact --
One of the parameters expected to influence the bioavailability of nicotine is the ratio of nicotine in the gas phase to the ratio of nicotine in the particulate phase; correct?
A. Yes. Dr. Reininghaus, who is a physicist himself and has extensive experience -- experience, was going through the -- a list of potential physical parameters and then in subsequent pages discusses his knowledge in depth relative to the current situation in a cigarette.
Q. Right, okay. So that's one of the parameters he -- he discusses; correct?
A. Yes.
Q. Okay. And another one on -- and I -- and I'm not trying to exclude, to -- to -- to do anything tricky by excluding them and I acknowledge there are several other different parameters, but I just want to focus on a couple.
A. Uh-huh.
Q. Under two, "Nicotine deposition and diffusion,"

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the second one he lists is "nicotine transport in the lower respiratory tract." Do you see that?

A. That's what it says.

Q. What is meant by "nicotine transport in the lower respiratory tract"?

A. Specifically I would assume it could be two different things. Number one, I would say it would be the form in which the nicotine is present; that is, is it associated with a particle or not. And number two, it could be the transport of nicotine across the membranes.

Q. Okay. And "the lower respiratory tract," that refers to the lungs; right?

A. Well I think these are general statements. It could refer to the particle size issues that he subsequently discusses or it could refer to transport across membranes.

Q. Okay.

A. I think it's a very general statement.

Q. No, I understand. But when he says "lower respiratory tract," that's the lungs; right?

A. Yes.

Q. Okay. And a third -- a third one I want to talk about, it's under "Nicotine uptake," is the second one listed under "Nicotine uptake," "nicotine

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penetration of the respiratory barrier."
A. Uh-huh.
Q. Do you see that?
What's the respiratory barrier?
A. In the context of what he's discussing, it would be the membrane between the lung and the capillaries.
Q. Okay. And that's a barrier to nicotine crossing it; right?
A. Actually not -- not really. It's a very efficient process and our -- our lungs physio -- and lung physiology is designed very efficiently because of the huge surface area to absorb oxygen, which we need all the time for our brain.
Q. So it's your testimony that things that go into -- that -- that oxygen that goes into our lung doesn't have to cross any -- any barrier?
A. It --
MR. FOWLER: Object to the form of the question.
A. It crosses -- it crosses a membrane, but what I'm trying to say and has been said extensively in the literature, there is a very efficient physiological design because oxygen is so important to our function. And in that context, that's why you

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have a huge surface area in the lung. That's why you have buffering capacity, so it is efficiently designed to uptake materials.

Q. When we inhale oxygen, are we inhaling gas-phase or -- or particulate-phase oxygen?

A. Air that you inhale is certainly in a gas -- gaseous form.

Q. Okay. Direct your attention to the second paragraph -- or excuse me, the second page and the -- under point number one, the third paragraph down where it talks about vapor pressure. Do you see that, vapor pressure?

A. Yes.

Q. Could you read that, please.

MR. FOWLER: I'm sorry, where is that?

THE WITNESS: I think the third paragraph down under number one.

MR. FOWLER: Okay, I've got you.

A. "The vapor pressure of nicotine at the particle/gas phase interface, which influences the phase distribution of nicotine and thereby its transport kinetics, is determined by the nicotine concentration, the particle pH, the particle radius, and the temperature."

Q. Okay. And "transport kinetics," that -- that

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refers to transport across the membrane; right?
A. Dr. Reininghaus was describing here the basic physical parameters that would be operative in any particle per se no matter if it's in the lung or anywhere else. He's a physicist.
Q. Okay. Now if you turn to page three, under point three, what does that first sentence say?
A. "Due to," is that --
Q. Right.
A. Okay. "Due to the selective membrane permeability only unprotonized nicotine (Pka=8) can freely penetrate the mucosa or the bronchial alveolar lining."
Q. Okay. In other words, only free base nicotine can cross the bronchial membranes; right?
A. I --
MR. FOWLER: Object to the form.
A. I disagree with the characterization. I also disagree. In terms of a practical sense, we know that most nicotine is absorbed from the particles of smoke. Greater than 90 -- 85 percent, 90 percent of the nicotine is absorbed in one puff, and because of the pH of the lung in the body, which is 7.4, which is more basic, there is a driving force to absorb nicotine. At pH 7.4, you'd have 20 percent of the

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nicotine at the surface of the lung in the nonprotonated form, and that doesn't change no matter what is in the smoke.

Q. Is it your testimony that protonated nicotine will pass through the lung membranes?

MR. FOWLER: Object to the form.

A. It is my testimony that -- that the nicotine that is in the particles that goes into the lung is then quickly associated with the lung mucosa and brought to a pH of 7.4. In that form, 20 percent of the nicotine is -- is in the nonprotonated state. Absorption is rather rapid. As that nicotine is absorbed, there -- more of the protonated nicotine would then become nonprotonated, and there is a continual and very efficient process. And the pH of the body, as you well know, does not change --

Q. Okay.

A. -- and is more basic than the pH of the smoke.

Q. Okay. I -- I -- I appreciate what you're trying to tell me, and -- and maybe my questions aren't clear. If I understand your testimony, you're saying that if it goes into the lung protonated, the pH of the lung is going to change it and it's going to unprotonate and -- and cross into the lung. Is that basically what you're saying?

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A. Part of the normal physiological process and the pH of the lung will dictate that the nicotine at the surface of the lung will be at a certain pH no matter what the pH of the smoke.

Q. Okay. And -- and I understand your testimony is basically that no matter how the smoke goes in, once it gets to the lung, it's going to convert to unprotonated and cross the membrane, right, or most of it is?

A. There is a cyclical type of process whereby you have a number of physical factors. The huge volume and capillary flow creates an equilibrium whereby any substance is pulled into the capillaries, and take that with the adjustment of the nicotine in the context of pH 7.4 and the buffering capacity of the lung, and you have a constant driving force for absorption.

Q. Okay. My question, though, is: Before the nicotine unprotonates; in other words, when it's still protonated, before that 7.4 pH of the lung surface has been able to -- to unprotonate the nicotine, in its protonated form it doesn't pass the lung barrier, the lung membranes, does it?

A. It would be deposited on a huge surface area and be absorbed in the context of that puff. We know --

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Q. As protonated nicotine?

MR. FOWLER: Object to the form. I --

A. No. We -- we basically already discussed the process whereby at the surface of the lung at pH 7.4, 20 percent of the nicotine would be nonprotonated. There would be a continual driving force with the equilibrium of the capillary flow to move that nonprotonated nicotine into the -- into the blood flow, and then more nicotine at the surface would immediately in a continual basis become nonprotonated because of the pH at the local site would keep that ratio the same.

So more and more nicotine would continually be adjusted to a nonprotonated state and absorbed. That is part of the physiological efficient process in this -- in the lung and it's part of normal lung physiology.

Q. Okay. You used the phrase "adjusted to unprotonated state." Okay? Do you -- do you recall using that phrase --

A. "Nonprotonated" I believe I said.

Q. "Nonprotonated," okay.

A. Yeah.

Q. Before a protonated nicotine molecule has been adjusted to the nonprotonated state, can it pass the

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lung membrane?

A. At the surface of the lung?

Q. At the surface of the lung.

A. At the surface of the lung, I think it is -- it -- well you're asking me to -- to play into an area where it would be very difficult to have analytical measurements. Okay? So based on what we know, though, of membrane transport, it would be more difficult for a protonated molecule to be transported. It's not as facilitated. Okay? But we certainly know -- we certainly know -- that with one puff, in just a few seconds, that most of the nicotine is depleted from the particles, and we certainly know that in seven to eight seconds that nicotine is absorbed and is transported.

So it is a very quick and efficient process, and to represent that in any physical or physiological way there is an ability to control or manipulate at the surface of the lung I think grossly misrepresents the physiological process in play in the lung surface.

Q. Okay. And in fact, that's essentially what Dr. Reininghaus says in this whole paragraph three, right, that by the time it gets to the lung surface it's all going to get absorbed or a vast majority of

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it's going to get absorbed regardless of the pH going in?

A. Dr. Reininghaus and others have indicated pretty much that the -- the pH per se that we know from physical measurements of exhaled nicotine and we know from other studies. He is discussing the analytical parts that we do know about.

Q. Okay.

A. And he's also in some cases theorizing.

Q. And that's --

That's Philip Morris's position, that no matter what the pH of the smoke going in, the vast majority of the nicotine will be extracted by the lung?

A. I think it's more than a position. That's an analytical fact.

Q. Okay. Dr. Reininghaus has one little caveat there to his conclusion, though, doesn't he?

A. Yes.

Q. What's that last paragraph? Would you read that, please.

A. Yes.

MR. FOWLER: The last paragraph under three?

MR. GORDON: Under three.

MR. FOWLER: Thank you.

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A. "However, an influence of smoke pH on nicotine kinetics in the lower respiratory tract cannot be excluded: pH-enhanced gas phase diffusion of nicotine to the mucosa might increase its uptake rate."

Q. In other words, it might get in faster even though the same amount ultimately gets in; right?

A. Well, let's look at it. If you have coming from a cigarette a -- an -- a increased gas-phase-to-particulate-phase ratio of nicotine, there are studies to indicate that that gas-phase nicotine would be absorbed in the oral mucosa. Gas phase, as he indicates, is and does diffuse rapidly, and with the 11C PET studies recently done on the Nicotrol product -- that's Pharmacia and Upjohn -- that it clearly shows the gas-phase nicotine would be absorbed largely in the oral mucosa.

So coming from a cigarette, the ratio of gas phase to particulate phase would result, if it does, okay, if there is a change, that it would result in the absorption in the oral mucosa.

Q. Is it your testimony that all gas-phase nicotine is absorbed in the -- in the mouth?

MR. FOWLER: Object to the form.

A. No, it's not my testimony, but what is my

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testimony is that if there is any substantial change in that ratio coming from a cigarette, you would see less nicotine absorbed through the lung and not more --

Q. Okay.

A. -- based on every physical parameter and physiological parameter I'm aware of.

Q. What percentage of nicotine in a -- in cigarette smoke gets absorbed in the mouth?

A. Relatively little because the gas-phase ratio in normal cigarette smoke is 1 to 2 percent. Most of the particles are inhaled and absorbed. The nicotine is absorbed in the lung.

Q. What percentage of the gas-phase nicotine is absorbed in the mouth?

A. I don't know if I have specific values or understanding on that 1 to 2 percent, nor do I know how one would attempt to study that analytically.

Q. Does any gas-phase nicotine get to the lungs?

A. Certainly in the context of the lung because of again normal physics, when you take a particle and you -- and it is propelled in space or in air, it will evolve materials, yes, and I think that that is indeed part of the results that Pankow is reporting under his artificial conditions. However, if the

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nicotine gas-phase-to-particulate-phase ratio coming from the cigarette is such that the gas-phase nicotine is more, most of that will be, as everybody knows, absorbed more in the oral mucosa.

Q. You say "most of that." What -- what -- what figure do you have, 51 percent, 95 percent?

A. Of the 1 to 2 percent -- of the 1 to 2 percent of the total?

Q. Right.

A. I -- we're really splitting hairs here in terms of the normal absorption of nicotine. I would not even want to hazard a guess, but I would say based on the Nicotrol studies, the Nicotrol studies indicated 45 percent.

Q. 45 percent of the gas-phase nicotine is absorbed in the -- in the mouth?

A. 45 percent of the nicotine coming from the Nicotrol inhaler was absorbed in the mouth or found in the mouth under PET.

Q. And that means 55 percent of it went on to the lung; right?

A. No.

MR. FOWLER: Object to the form.

A. No. Actually very little of it, just a few percent of it, went on to the lung because they did

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other studies and they found it in the stomach and -- and other places.

Q. So the gas --

The gas-phase nicotine that goes into the human sys -- respiratory system, very little of the gas-phase nicotine ever gets to the lung; is that your testimony?

A. Based on the Nicotrol studies. And by the way, the material absorbed through the lung most likely -- and it depends on the time frame, but most likely would be the ones responsible for the nicotine found in the periphery because that circulatory system obviously doesn't go directly to the brain. It goes -- goes to the periphery first.

So you would see the 11C PET labeling in other tissues and organs and would have to add -- add those together.

Q. Let's take a look at that appendix to Dr. Reininghaus's letter, Exhibit 1327. What -- what's the title of the appendix?

A. "The Effects of Cigarette Smoke 'pH' on Nicotine Delivery and Subjective Evaluations."

Q. Okay. What's the first line of paragraph two?

A. "The argument that bases are added to increase ... nicotine delivery above normal levels is

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entirely specious."

Q. You agree with that, don't you?

A. Yes.

Q. That's the position that Philip Morris has told the public ever since 1994; right?

A. That's the position that is supported by all of the data and facts that I'm aware of in commercial cigarettes.

Q. And Philip Morris has been saying that to the public; right?

MR. FOWLER: Object to the form in terms of foundation.

A. In terms of some limited communication through some advertisements that we do not man -- manipulate, I don't know if we specifically stated what's in this sentence, but we have stated that we do not manipulate.

Q. And you -- you don't increase nicotine delivery above normal levels by adding bases; right?

A. You would fundamentally change the cigarette and change the tar yield, and within the levels of the commercial cigarette, as I indicated before, with the heat of combustion, that driving force far outweighs any other mechanism in delivery and transfer of nicotine in the cigarette.

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Q. Okay. What's the next line?
A. "The same amount of nicotine is delivered whether the smoke" -- "smoke is acidic, basic, or neutral."
Q. You agree with that; right?
A. Well, given an equal volume of smoke, the issue is, is if you make the cigarette more acidic or if you make it grossly more basic, you're going to fundamentally change the burn and the material such that you change the puff count and the tar delivery. You're fundamentally changing the cigarette, but given a -- you know, and not -- not discerning what -- whether it was delivery in the oral mucosa or de -- excuse me, delivery in the lung, equal volume of smoke, it shouldn't have any -- any effect whatsoever.
Q. Okay. So the same amount of smoke then, whether the smoke is acidic, basic or neutral, you're going to have the same amount of nicotine; right?
A. If you're looking at a puff of smoke without taking into consideration the impact of added materials on the burn of the cigarette, okay, which that experiment I don't think has been done, because what you're talking about and the studies that I'm aware of indicate that different acidic, neutral,

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basic materials are added to the cigarette and there are multiple changes that that then can impact on the burn of the cigarette. You can get more puffs. For example, you add potassium. Potassium is a burn modifier.

If you modify the burn of the cigarette, you're fundamentally under normal conditions of these experiments going to change the number of puffs you have. If you have more puffs in one cigarette versus another -- another cigarette, you're going to have more tar. If you have more tar, you're going to have more nicotine, artificial condition.

Q. Okay. Maybe you didn't understand my question. If you have -- once -- however it's gotten there, once you have a puff of smoke --

A. Uh-huh.

Q. -- volume for volume, it's your position that whether that smoke is acidic, basic or neutral, the same amount of nicotine is going to be there?

MR. FOWLER: Hold on.

A. Oh, I'm going to have to have that one -- I'm not sure that was your question before. The same amount of nicotine will be there?

Q. The same amount of nicotine will be delivered in that --

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MR. FOWLER: I'm going to --

Q. -- in that same volume of smoke?

A. I'm going to have to have that repeated.

MR. FOWLER: I'm going to object to the form of the question. Could you repeat the question. It's hard --

MR. GORDON: No. I'm going to withdraw it and move on.

Q. Read that --

If you'd read that sentence again, "The same amount of nicotine."

A. "The same amount of nicotine is delivered whether the smoke is acidic, basic, or neutral."

Q. Okay. Now could you read the next sentence.

A. "Only the form, not the amount of nicotine is changed."

Q. What did you understand that sentence to mean back in 1994 when you got this?

A. What I understood this section to mean is that the bottom line here is -- is that the -- well that sentence in particular, only the form, not the amount of nicotine, is that if you go past experimental -- if you go toward experimental conditions past normal commercial cigarettes, you might change the ratio of gas phase to particulate phase nicotine, but the

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amount of nicotine is not changed, as indicated before.

Q. What's the difference if you change the gas-phase-to-particulate-phase ratio?

A. What's the difference in what?

Q. In terms of how it affects the body.

A. It depends on what level. If you go to the levels of a cigar, pH 8, 8.5, people don't inhale. It's extremely irritating, the smoke is. Therefore, the absorption of -- of smoke and nicotine is through the oral mucosa.

Q. Okay. He goes on to -- whoever --

By the way, do you know who authored this? Do you recall it was Frank --

A. I --

Q. -- Frank Gullotta?

A. It could have been. I don't recall specifically.

Q. Okay. The --

This then goes on to discuss a study, does it not?

A. Yes.

Q. On nicotine aerosols; correct?

A. Yes.

Q. The subjects were given the same amounts of

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nicotine at three different pH levels; right?
A. Yes.
Q. Okay.
A. And it's referenced.
Q. Now what -- what --
What does it say was found in this study where the smoke -- where the people were given three different levels of pH but the same amount of nicotine?
A. Yes.
MR. FOWLER: Hold on for a second. Do you know which study that refers to?
MR. GORDON: No. I've been asking for over a year for Philip Morris to provide me with the reference that's cited there, and Philip Morris has still not provided it to me. I'd sure appreciate any help you could give since you're with Shook Hardy.
A. Well first of all, let's talk about nicotine aerosols. Nicotine aerosols have a different particle size. The particle size of a nicotine aerosol would mean that it would not be inhaled; it would be impacted on the oral mucosa. In that situation, pH would potentially impact the rate of absorption through -- through the oral mucosa, and therefore you would have different peak

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concentrations of nicotine in the blood because of the transport across the membranes. These are aerosol particles, different.

Q. Okay. And what did they find in this study?

A. And there -- by the way, that reference probably refers to some of the literature, not -- not Frank Gullotta's own work, and this is -- I recognize some of these pHs as consistent with what is in the literature on this.

It says that it was found that higher peak concentrations of nicotine in blood were achieved, and that could be because of --

Q. Achieved what? Achieved how?

A. Achieved --

MR. FOWLER: Well hold on, hold on. Go ahead and answer -- answer -- finish answering your question. He can follow up if necessary.

Q. You were reading a sentence and --

A. Yeah.

Q. -- and you stopped in the middle of it.

A. "It was found that higher peak concentrations of nicotine in blood were achieved at higher pHs."

Q. Okay. And the -- the same --

The amount of inhaled nicotine was the same; right?

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A. It then says "Since the amounts of inhaled nicotine were the same, the results indicate that the higher" -- "higher the pH, the more rapidly nicotine enters the blood stream."

Q. Okay.

A. And again I emphasize these are nicotine aerosols deposited in the oral mucosa, and under those conditions, there a liquid environment, they would potentially impact the absorption of nicotine in the oral mucosa.

Q. Okay. And they conclude that in this study that eventually all of the nicotine, regardless of the pH, enter the bloodstream; right?

A. "Eventually, of course, all of the nicotine, regardless of" the "pH, would enter the blood stream. Only" the "rate of entry is pH dependent."

Q. Only the speed with which the nicotine enters the bloodstream is dependent on pH; correct?

A. In the -- in the oral mucosa, which is acidic in nature, pH would have -- first of all, the buffering capacity is less. The lungs have huge surface area and buffer -- buffering capacity, and the oral mucosa is a much different environment than the environment in the lungs.

Q. This then goes on to discuss an internal Philip

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Morris study, does it not?
A. Yes.
Q. Okay. And that's not a study involving nicotine aerosols, is it?
A. Let me read this.
MR. FOWLER: You're starting with the next paragraph, --
MR. GORDON: Right.
MR. FOWLER: -- the third paragraph?
A. It is not a study of aerosols.
Q. It's a study of actual cigarettes?
A. Yes. I believe we saw that -- reference to that same study earlier.
Q. It's the study we talked about earlier --
A. uh-huh.
Q. -- where nicotine as a citrate had less electrophysiological effects on the brain than nicotine as a free base; right?
A. Even though equal amounts of nicotine were delivered.
Q. Right. And the last paragraph on this page also discusses an internal Philip Morris study; correct?
A. Yes.
Q. This is a different study, though. This is a study where nicotine itself wasn't added, but a

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chemical compound that adjusted the pH of the filler; right?

A. Yes, calcium hydroxide.

Q. Okay. And it was at three different levels: 0 percent, 1 percent and 2 percent calcium hydroxide; right?

A. Yes.

Q. And that altered the pH --

Well the pH for those three were 5.7, 6.6 and 8.0 respectively; correct?

A. Yes.

Q. And the nicotine deliveries were very close to each other; right?

A. Very close.

Q. Virtually the same; right?

A. Virtually the same, certainly within analytical variation.

Q. Okay. And they concluded that the filler pH had no effect on the nicotine delivery; right?

A. That's what it states.

Q. Okay. But what did they find?

A. It says "We found that increased filler pH resulted in enhanced electrophysiological and subjective effects ...."

Q. And how did they interpret that data?

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A. "We interpreted these data to mean that higher pHs resulted in more unprotonated nicotine - a more physiologically effective form."

Q. Okay. And the fact of the matter is that no matter how much nicotine -- well strike that.

A. Well let me -- let me --

Q. No, I -- there's no -- there's no question pending. Let -- let me think a moment how I want to phrase a question.

A. Okay.

MR. FOWLER: But if you need to go back and -- and enhance or change an answer for it to be accurate, you should feel free to do so.

THE WITNESS: Well we read two sentences into the -- into the record, and in the context of those two, I think it's important to note certain -- certain things.

First of all, as indicated previously, the citrate, even though equal amounts of nicotine are delivered, the citrate has subjective impact, and that does affect electrophysiological responses. We interpreted these data to mean that higher pHs resulted in more unprotonated nicotine, and that is in fact perhaps their interpretation, but not an analytically proven event. And even if it did result

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potentially in more unprotonated nicotine, that unprotonated nicotine, as I indicated before, would be extremely slight, would be diffused into the oral mucosa, would potentially be acting on the trigeminal nerve, would potentially be enhancing impact in that context.

And so those are all things that might potentially be happening; we don't know. But the bottom line in all of this is that the total amount of nicotine is the same. The bottom line in all of this is that if the nicotine is slightly enhanced in the gas phase, it would be absorbed in the oral mucosa, and that would then decrease the amount of nicotine that is absorbed in the lung and that goes to the brain.

MR. GORDON: I move to strike as nonresponsive.

Q. Can you explain why increasing the pH of tobacco filler by adding chemicals results in the same delivery of nicotine but increased electrophysiological responses.

A. Well there could be -- that's a very complex situation. There could be any number of explanations. One, adding that level of base affects the burn of the cigarette, and you would adjust the

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puff count, as I indicated before. Two, adding that level of base potentially could destruct the actual cellulose structure of the tobacco and in that context potentially affect puff count delivery and other distillation mechanisms.

These are artificial conditions and not consistent with normal cigarettes in the marketplace.

Q. Okay. Do you agree that unprotonated nicotine is more physiologically effective than protonated nicotine?

MR. FOWLER: Object to the form of the question.

A. I fundamentally disagree with that character -- characterization, and here's why: In the body at pH 7.4 -- and we are all pH 7.4, and if we end up changing our pH in our body, we will have severe consequences and probably wouldn't be sitting here. But at 7.4, the ratio within the body of nicotine is the same. It doesn't make any difference. You're going to have the same ratio of nonprotonated to protonated nicotine in the bloodstream no matter what, and therefore there is no such thing as a more physiologically effective form.

Q. You say we're going to have the same ratio. Are

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we going to have it in the exact same time frame regardless of the pH of the smoke?

A. Under artificial conditions, you know, depending on what the conditions of the study are, you could have different situations. But what I'm trying to represent here is within normal commercial cigarettes, these theories are not operative.

Q. What --

What is the pH of Marlboro smoke?

A. The pH of Marlboro smoke is approximately 6.0. It ranges from 5.8 to 6.2.

Q. Has it always been that way?

A. To the best of my knowledge -- and I have gone back, but I will represent to you that going back and looking at as many pH values as we could have, we did not routinely measure the pH. It is a false measurement to begin with because pH, as you know, is the negative log of the hydrogen -- hydrogen-ion concentration in a solution.

Smoke is not a solution, and therefore as a technical -- in a technical sense, "pH of smoke" is technically not a correct term and has not been a focus of continuous measurement throughout the years.

On the spotty data that we do have under

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different analytical conditions, there's no indication that there was any significant increase in pH in a Marlboro over time.

Q. What's the pH of a Winston?

A. If I recall specifically and recently from the Labstat data -- let me see. I don't recall them measuring pH, but I do recall them measuring ammonia. You would get with different filler ammonia levels -- and I think Winston had in filler approximately half the ammonia level that a Marlboro had. Interestingly, in smoke you would measure the same level of ammonia, even though in filler you only had half. Now why is that? That's because ammonia's naturally occurring in smoke. It comes from the breakdown of the proteins that are part of the tobacco, and so therefore you will get ammonia in smoke. You don't have to add ammonia to tobacco to get ammonia in smoke.

Under those conditions, even though the soluble ammonia in the tobacco filler was half in a Winston, the nicotine delivery and the ammonia in smoke was similar to a Marlboro.

Q. I'm going to move to strike as nonresponsive.

Do you know the pH of a Winston?

A. I don't. I offhand don't know, but I suspect --

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hmm, was that Winston or Camel? I think it was Camel that was represented in the Labstat data, so I would have to go back and take a look.

Q. Do you know what the pH of a Winston was in 1964 when Philip Morris started using ammonia?

MR. FOWLER: Object to the form of the question.

A. I certainly don't know sitting here today what that was.

Q. Do you know if it was higher or lower or equal to what Marlboro is today?

A. I would, based on everything else I know in terms of the impact a significant change of pH would make on the subjective properties of a cigarette, would have to represent to you that, based on that information, it was likely to be similar.

Q. So if it turns out that Winston was lower than Marlboro, that would be a surprise to you; is that what your testimony is?

MR. FOWLER: Object to the form of the question.

A. Winston smoke, Winston filler, pH of what?

Q. Winston -- Winston smoke.

A. Winston smoke. If it was lower, I would say that there are certain phenomena -- and interestingly

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enough, as you puff down a cigarette, the p -- it gets more acidic, and so the pH of smoke if you go puff by puff actually creates a situation where you get more acidic smoke, not more basic smoke, so you would actually be creating a situation potentially where you have more acidic smoke as you puff a cigarette.

Now in terms of a Winston, I don't know specifically under the measurements of an artificial condition; that is, pH of smoke, what the Winston smoke was in 1964.

MR. GORDON: No further questions in this section.

THE REPORTER: Off the record, please.

(Luncheon recess taken at 12:46 o'clock p.m.)

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AFTERNOON SESSION

(Deposition reconvened at 1:41 o'clock p.m.)

(Category II deposition continued and will be bound under separate cover labeled "Volume II-A.")

ADVERSE EXAMINATION

BY MR. SILBERFELD:

Q. Dr. Ellis, good afternoon.

A. Good afternoon.

Q. We are here to take your testimony as the representative of Philip Morris, the company now, not your personal views, on the subjects of whether nicotine produces a dependence, whether nicotine is addictive. You have a general understanding about that, do you not?

A. Yes, I have a general understanding of that area, yes.

Q. Okay. And what have you done in order to prepare yourself to give testimony with respect to this particular area?

A. Certainly I have reviewed the documents that have been generated internally on the topic and certainly I've generated document -- I'm sorry, looked at the literature relative to the topic.

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Q. With respect to the internal documents that you've looked at, can you tell us the magnitude or the number of such documents that you've looked at in order to prepare yourself for giving this area of testimony.

A. For this specific area?

Q. Yes, ma'am.

A. I would say in terms of number of documents, we'd probably be talking about 25 or so, if that.

Q. And from that coupled with your own background, training and experience, have you formed an impression in your mind as to what Philip Morris knew over the course of the last 20 years or so about whether nicotine in cigarettes and in cigarette smoke has any dependence-producing property or is addictive in any way?

A. Let me back up just a second. Was your previous question internal documents?

Q. Yes, ma'am.

A. Okay, that's fine. In addition to the internal documents, obviously the literature was quite extensive, and in that context there have been a number of conflicting views. I think there are a number of issues associated -- associated with the terminology. I think it is a very confusing area,

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and I think that that is a key issue whenever there's any subsequent discussion in this area.

Q. Based upon your review of the company documents, the literature you looked at --

A. Uh-huh.

Q. -- and your own background, training and experience --

A. Uh-huh.

Q. -- have you formed an impression in your mind --

A. Uh-huh.

Q. -- as to what it was that Philip Morris knew over the course of the last 25 years about whether or not nicotine has the propensity or capacity to produce dependence or addiction in cigarettes?

A. Have I formed an opinion? Yes.

Q. Okay. What did Philip Morris know over the course of the last 25 years about whether or not nicotine in cigarettes was capable of producing a dependence or an addiction?

MR. FOWLER: I'm -- I'm going to object to the form given the great breadth of that question, but you can go ahead and answer it as best you can.

A. Well certainly in the past 25 years there has been extensive work done in terms of looking at nicotine in a variety of animal tests and in a

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variety of other contexts. For example, there were many, many nicotine studies begun in the 1970s and even before that, and in the context of internal work, Dr. DeNoble did some work in the area. His work and his documents reflect that he did not conclude that nicotine was addictive in -- and that is stated in virtually all of his documents, using that word and that terminology for whatever he -- he meant it to mean in that context.

Since then there have been numerous studies and discussions relative to the role of nicotine in cigarettes and the potential role for nicotine in any kind of dependence-producing scenario. Much of the discussion in the literature today stems -- and I point out a recent NIDA Notes article, Dr. Perkins, who is beginning to discuss the non-nicotine factors associated with smoking. Nicotine per se in gum and patch has been shown by Dr. Henningfield to have low abuse liability.

And in the context of those, I think I've given you a summary I think of the complexity of the area, the need to define the situation and the role of nicotine as I see it in terms of the evolving definition and the evolving data in this area.

Q. What is Philip Morris's position today on

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whether or not nicotine in cigarettes has the propensity to produce either dependence or addiction in smokers?

A. I think the best way to describe it is because of the number of people that have quit smoking, it is very apparent that people can quit if they decide to do so. Given that context and a very simple def -- definition of "dependence," one can decide to quit. I think that is the ultimate issue. That is the ultimate piece of data.

That has certainly been demonstrated over and over again, has been documented in the Surgeon General's reports, and people do so with little -- little or no help, certainly 95 percent or more. I think that is the most important aspect of the whole situation.

Q. With that as background, can you tell me whether or not Philip Morris believes today that nicotine in cigarettes produces either a dependence or an addiction in smokers?

A. I think that, based on the data that's available today, that cigarette smoking is a complex behavioral -- behavioral function, and I think that it is very difficult to look specifically at nicotine and a role of nicotine. Nicotine can have sensory

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and does have sensory functions in a cigarette and thereby for that purpose is important to the cigarette. And I think it is very difficult to be able to with the current methodology and current studies begin to isolate simply nicotine's role in terms of the -- in the definitions that we're talking about.

I think it is complex, and I think that with a behavior that people do multiple times a day, they can, individuals can, get used to doing that behaviorally.

So if your definition of "addiction" is one of a repeated behavior, certainly cigarette smoking is a repeated behavior. If your definition is pharmacologically based, even the Surgeon General indicates that nicotine is not intoxicating, and I think that we need to go past to what really this whole thing is in terms of a definition.

Q. I'm pleased to have a discussion with you about the definition and --

A. Okay.

Q. -- I understand your views in that area and we'll get to that, but just so that there's a clear answer --

A. Uh-huh.

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Q. -- for the jury in this case to hear, does Philip Morris believe today that nicotine in cigarettes can produce either a dependence or an addiction in smokers? And that can be answered "yes" or "no," and I'm pleased to have you explain the answer.

MR. FOWLER: And I'm going to object to the form to the extent that dependence or addiction isn't defined for that question, but go ahead and answer.

A. Under pharmacologically objective criteria, no.

Q. So using pharmacologically objective criteria, Philip Morris's position is that nicotine in cigarettes does not produce either a dependence or an addiction in smokers?

A. That's correct.

Q. Now let's turn to the definition.

A. Okay.

Q. The pharmacologically objective criteria that you use in order to define either dependence or an addiction are what, ma'am?

A. Pharmacologically objective criteria are intoxication, tolerance to the intoxicating effects and physical dependence.

Q. Physical dependence characterized by withdrawal symptoms?

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A. Yes, and physiologically based.

Q. Physiological dependence, not psychological dependence?

A. Correct.

Q. And is that definition of dependence or addiction -- and we can use these interchangeably, can't we, ma'am?

A. Technically, no, and -- and -- but because the -- the words are loosely defined, people do. I think that "dependence" is being used in a different sense because "addiction" has lost meaning and has had a broad application both to all the way from, you know, video games -- and Dr. Koop used that himself, reference to video games -- all the way to severe clinically based mental institutionalization and physiological and biochemical modifications to bodily function. So it is a very broad definition.

Now dependence tends to moderate in terms of its role and is -- tends to be defined more on the order of tolerance and physical -- and physical and -- and withdrawal per se, so you'd have more of those as being the criteria. And there would be more of a behavioral component to the "dependence" term than you would necessarily have in terms of the "addiction" term, especially at the severe

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physiological states of addiction.
Q. In fact, you've seen the literature that says "dependence" and "addiction" are used interchangeably or synonymously because in the way they're used these days they mean the same thing; right? You've seen that literature?
A. I've also seen in the literature where they have gone away from the term "addiction" to the term "dependence" because "addiction" has lost meaning and they feel that "dependence" has more meaning, so I think both exist.
Q. All right. The pharmacological definition of dependence -- let's just use that term for the balance of this discussion -- that's Philip Morris's definition of what a dependence is, intoxication, tolerance to the intoxicating substance and physical dependence characterized --
A. Well --
Q. -- by withdrawal?
A. -- no. I think that dependence is more or less defined in DSM-IV per se, and I think that is where it is more behaviorally based than it is a pharmacological definition.
Q. My question is: The criteria you used --
A. Uh-huh.

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Q. -- to determine whether or not nicotine in cigarettes produces a dependence --

A. Right.

Q. -- are these three criteria; right?

A. I'm sorry, which three criteria are you referring to?

Q. The pharmacologically objective criteria of --

A. Of --

Q. -- intoxication, tolerance to the intoxicating substance and physical dependence characterized by significant withdrawal symptoms.

MR. FOWLER: Object to the form of the question.

Q. Have I stated that correctly?

A. Those -- those are -- those are correct, but now what's your question now that I know the criteria?

Q. All right. Simply put, whose definition of --

A. Oh.

Q. -- dependence is that?

A. That definition has been used and certain criteria, those criteria have been used over the years to describe addiction per se. One of the references to that definition is Jerome Jaffe in particular, and there are others in the literature, but those terminologies by themselves have been

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common quantitative indicators of that physiological state.

Q. Does the American Society of Pharmacologists use that definition of dependence?

A. I'm not aware that they have a definition of dependence per se.

Q. Does any major medical or public health organization in this country use the definition of dependence as you've given it to us, ma'am?

A. They have over the years certainly had those criteria in mind, and certainly the '64 Surgeon General's report used those criteria. As we've already indicated, it's been an evolving situation. There isn't a clear definition and clear quantitative criteria.

In an attempt to have a discussion, it's -- it's our attempt to put forth some of the clear quantitative criteria that have been used to characterize classic drugs of abuse in the past.

Q. In 1997 does any major medical or public health organization in this country use this definition of dependence that you've given us?

A. To my knowledge, the DSM defines the psychiatric society's definition under a largely behaviorally based set of criteria. I am not aware within the

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United States -- I think WHO has a definition and others have definitions, but in terms of some of the other societies, I'm not aware that they have established clear definitions.

Q. You're aware certainly that none of the organizations you've listed require intoxication in order for dependence to be present. You're aware of that, aren't you?

A. Of the organizations I've listed, I indicated that I'm not sure that there are established definitions by the American Physiological Society or the American Pharmacolog -- Pharmacological Society per se. In other definitions, WHO, DSM, generally those definitions have gone to a behaviorally based definition with behaviorally based criteria.

Q. And they do not require intoxication in their definition, do they?

A. Some --

MR. FOWLER: Object to the form.

A. Some may do -- may -- may require that and some may not.

Q. Let me --

A. And it depends on the terminology.

Q. All right. You mentioned DSM-IV. That's the Diagnostic and Statistical Manual of Mental Disorders

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put out by the American Psychiatric Association; correct?

A. Yes.

Q. And DSM-IV is the most recent version of what the American Psychiatric Association has published on this topic and it comes out periodically. This one happened to come out in 1994. Do you recall that?

A. Yes.

Q. Let me put that before you.

MR. SILBERFELD: And frankly I don't remember if that's ever been marked. Let's mark it.

(Discussion off the stenographic record.)

(Plaintiffs' Exhibit 1328 was marked for identification.)

BY MR. SILBERFELD:

Q. Dr. Ellis, you have before you Exhibit 1328, which is part of the DSM-IV, and what I'd like to direct your attention to is you'll see page numbers in the upper right-hand corner if you turn the document towards you.

A. Uh-huh.

Q. If I could direct your attention to page 181. Do you see that, ma'am?

A. Yes.

Q. Are those the criteria for substance dependence

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as defined by DSM-IV?

A. Yes.

Q. And you've seen these criteria before, have you not?

A. Yes.

Q. Does this page have anywhere on it the word "intoxication" as a requirement for substance dependence?

A. It is embedded in here, for example, under tolerance. It states number (a) -- or letter (a), "a need for markedly increased amounts of the substance to achieve intoxication or desired effect."

Q. That's stated in the alternative; correct?

A. It certainly is a component of this definition potentially, yes.

Q. So just turning to that, one of the criterias for substance dependence is tolerance; right?

A. That's correct.

Q. And in fact, what the DSM-IV says here is that of these seven criteria, if any three or more are present in a 12-month period, that satisfies the definition of a dependence?

A. Correct, so tolerance perhaps is not even required.

Q. Right, because you don't need all seven. Any

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three of the seven present for 12 months satisfies the definition?

A. Correct.

Q. But turning to what you read, under tolerance, please define that term, first of all, for me.

A. Tolerance is a physiological state whereby one gets used to the substance so that you physiologically require more to get the same effect. It's an adaptation.

Q. And tolerance as used by the DSM-IV may be shown by a need for increased amounts of the substance either to achieve intoxication or the desired effect, whatever that may refer to?

A. Correct.

Q. Okay.

A. That's what it says.

Q. It does not say that you have to have intoxication alone, does it?

A. Obviously if you don't need that criteria at all, I think the fact that you only need three out of seven and they can be any three just reiterates the -- the question and utility of this definition.

Q. You don't accept this definition?

A. I certainly accept that DSM-IV has put forth this def -- definition and uses it. I certainly see

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that. However, I certainly see also that it is confusing, that there are multiple alternatives and situations it could describe.

Q. With respect to this document, referring you again to page 181 -- you were looking at something else. I didn't want to distract you.

Back on page 181, does Philip Morris believe that cigarette smoking produces tolerance in smokers?

A. Again I think -- and I reiterate at least in part my -- my stipulation on tolerance. It's intoxication or desired effect, so the tolerance would have to be toward the desired effect or the intoxication per se. If there's no intoxication and no identifiable desired effect, I don't believe that cigarette smoking or nicotine falls in that -- that category.

Q. And have you seen any Philip Morris documents authored within the last 25 years which discuss at all whether or not cigarette smoking produces tolerance?

MR. FOWLER: Object to the form of the question.

A. I'm not sure they discuss cigarette smoking. I think they do discuss nicotine and the peripheral

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tolerance that is achieved potentially upon adaptation to nicotine, but that isn't "intoxication or" the "desired effect," in quotes.

Q. Okay. So you have seen documents that discuss nicotine and tolerance?

A. Yes.

Q. All right. We'll get to some documents in a little bit.

A. Okay.

Q. With respect to the second criteria for substance dependence of withdrawal, does Philip Morris believe that cigarette smoking involves when it's stopped withdrawal symptoms?

A. Uh-huh, I think that there has been a discussion of some of the symptomatology associated with quitting smoking. I think the key word here is "characteristic withdrawal" syn -- "syndrome." Many of the symptoms that are discussed relative to quitting smoking are common symptoms of anxiety and stress, which is inconsistent with a, quote, "characteristic withdrawal syndrome" that is a typically used phrase for the classical drugs of abuse.

Q. The DSM says that withdrawal as a criteria for substance dependence is manifested by either (a) or

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(b). Let's look at (b) for a moment.

A. Uh-huh.

Q. "The same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms."

A. Yes.

Q. Do you see that, ma'am?

A. Yes.

Q. Do you believe that that's an accurate definition of withdrawal?

A. Well pharmacologically speaking, no, obviously, but I think that those are two components that can be used to describe withdrawal. On -- on item number (b), to be thorough, when you have the same or closely related substance taken to relieve or avoid withdrawal symptoms, it has been discussed in the literature and even by members of the Drug Abuse Advisory Committee that substituting nicotine gum, patch or substituting nicotine and it's been discussed in the literature extensively with Jed Rose and his articles and the articles of others that "nicotine replacement therapy," quote and unquote, is not very effective.

And therefore, when you consider cigarette smoking in this definition of withdrawal, I -- I believe there are significant weaknesses in matching

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up smoking with this definition.
Q. Does Philip Morris believe or has Philip Morris believed over the course of the last 20-plus years that smoking deprivation produces definite signs of withdrawal effects? Does the company believe that?
A. I think that individuals that are used to doing something on a regular basis, when they stop doing that, that there will be a situation whereby they may feel anxious, they may be stressed, and -- and just the habit of doing the same thing repeatedly is comforting to some individuals. And I think that those are the elements that we're talking about when we're talking about the symptomatology that's described when one seeks to quit smoking.
Q. So is the answer to my question "yes" or "no" or "maybe"?
MR. FOWLER: Objection.
Q. Does -- let me restate it for you --
A. Okay, please.
Q. -- so you have it clearly.
A. Please.
Q. Does Philip Morris believe or has Philip Morris believed over the course of the last 20 or so years that smoking dep -- deprivation produces definite signs of withdrawal effects?

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MR. FOWLER: Object to the form of the question, asked and answered.

A. I think if you look at the studies that have been done and if you look at the population, there are certainly individuals that can articulate that they can stop smoking and feel no symptomatology whatsoever. There are other people that will find it hard to stop smoking or will be anxious because of the change in their behavior.

And I think that it depends on the individual. I think it depends on their psychological makeup. I think that that is really the basis for the variability we see in the populations that are studied.

Q. So is the answer that Philip Morris just doesn't know whether smoking dep -- deprivation produces definite signs of withdrawal effects? It may occur; it may not occur; the company just doesn't know one way or the other?

MR. FOWLER: Object to the form of the question.

A. I think -- well, in terms of the studies that have been done with the nicotine gum and patch, if you were to put any kind of withdrawal symptom on nicotine per se, you would see similar types of

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effects when you stopped the nicotine gum or patch. And I think that it is much far more complex than nicotine. The NIDA Notes article June '97 indicates that.

I think that there is more data that is being generated to indicate that it is far more complex, and I think that yes, some people find it hard to smoke, but also we can look at the community and see that many people have successfully quit smoking.

Q. You said "hard to smoke"; you meant "hard to quit."

A. I'm sorry, "hard to quit."

Q. Okay. Based upon your review of company documents and your own training, background and experience, does Philip Morris believe that smoking deprivation causes definite signs of withdrawal effects?

MR. FOWLER: Object to the form.

Q. And again let me just --

A. Yeah.

Q. -- caution, you can answer that "yes," "no" or "I don't know," and I'm pleased to have you explain the answer, but just to get a clear answer to the question, ma'am.

A. And the issue is in some people it may and it

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may for behavioral or psychological reasons.
Q. And in other people it may not?
A. Precisely.
Q. How about the broad population of people who would like to quit, putting the extremes, those that have no problem and those that have massive problems aside, the broad band of people who would like to stop smoking and have tried, --
A. Uh-huh.
Q. -- does Philip Morris believe that those people exhibit definite signs of withdrawal effects; "yes," "no" or "I don't know"?
MR. FOWLER: Object to the form of the question, in particular the preamble. And -- and you can answer that question.
A. Putting aside the extremes -- and we can define the -- the extremes as those -- those that just pick up a few cigarettes a day or a week and those that would find it very difficult to -- to quit smoking for whatever reason. The large population in between has successfully demonstrated that they do quit and largely, 95 percent or more, without assistance. I think that given that scenario, many people do quit that are in this large population that you're defining.

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Q. Without withdrawal effects? That was the question.

A. Withdrawal effects as defined by anxiety, potentially. Withdrawal effects as defined by changing a life-style situation and getting used to a new routine of sorts, potentially. Withdrawal relative to being used to doing something multiple times a day and then not doing it, potentially. Withdrawal from some of the social aspects and -- and the sensory aspects, potentially.

So you can't really separate those things, and I think that's one of the elements and the confusion. But in the classical sense, in the quantitative sense, there isn't a physiological withdrawal per se that is demonstrated in the vast number of people that have quit successfully.

Q. You've seen studies that have looked at the attitudes of smokers, have you not?

A. Several, yes.

Q. And you understand that many people have expressed the view that they would like to quit smoking or cut down?

A. Yes.

Q. And they have tried, and some have succeeded and others have not succeeded in their effort to either

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cut down or quit smoking?

MR. FOWLER: Object to the form.

Q. You're generally familiar with that literature, are you not?

A. There are some studies that indicate that people would like to quit.

Q. Okay. Referring you to Exhibit 1328, particularly criteria number (3), which says "the substance is often taken in larger amounts or over a longer period than was intended," do you believe as the representative of Philip Morris now that cigarette smoking fits this definition; that is, that cigarettes are smoked more often in larger amounts or over a longer period of time than smokers intended?

A. Well, herein lies an issue. Intended when, when they started, when they're attempting to quit? I think that it is a broad issue.

Certainly the substance is often not taken in larger amounts. If that were the case, we would see consistently escalating, you know, smoking past the one- to two-pack average -- or actually one-pack average that currently exists.

Over a longer period than was intended, I -- you know, I -- when people like doing what they're doing, it's not surprising that people do that longer than

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they intend, so how to separate that out from a either psychological or any other type of dependence as associated with cigarette smoking I think is very difficult to determine.

Q. You've seen studies, have you not, where smokers indicate that their attitudes about their smoking behavior are that they wish they had quit but they continue to smoke? You've seen those studies, have you not?

MR. FOWLER: Could you read that question back for the witness.

THE WITNESS: Please.

(Record read by the court reporter.)

A. I would have to say that I can't think of a specific study per se that des -- is described as you are describing it now. There's no question that I believe that there are certain individuals who smoke who would -- who would want to quit that feel like they are having a hard time quitting, no question about that, but in terms of, you know, relating to specific studies, I would have a hard time doing that.

Q. Look at the fourth criteria, if you would. DSM-IV says that the fourth criteria for substance dependence is that there is a persistent desire or

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unsuccessful efforts to cut down or control substance use. Do you see that?

A. Yes.

Q. Does Philip Morris believe that that criterion fits cigarette smoking behavior?

A. For certain people, it might. For certain people, it doesn't. Some people do not have a problem stopping smoking. Other people find it harder to quit.

Q. Take a look, if you would, at the fifth criteria, and that is that a great deal of time is spent in activities necessary to obtain the substance. That one really doesn't fit cigarettes at all, does it?

A. No, I don't believe it does.

Q. Cigarettes are widely available?

A. Correct.

Q. Purchased on every street corner in this country virtually?

A. Well I wouldn't go that far, but I think that certainly in the -- in the intent that this was written and had been used historically, the intent of this -- these phrases is that quite frankly your time is spent with activities necessary to obtain the substance, including crime, to get money to buy

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illegal drugs, and that was really the intent as it was, you know, generated way back to describe drugs of abuse.

Q. I just want to see if --

A. Sure.

Q. -- there's one thing we agree on, and that is that this criterion in all probability does not apply to cigarettes.

MR. FOWLER: Object to the form.

Q. Because of their ready availability.

A. I -- I disagree with that characterization. I --

Q. What --

A. -- do not think that cigarette smoking leads to crime because part of the other aspect of this particular definition as it relates to the drugs of abuse is the intoxication, which led to poor judgment, which then leads to crime. So in that context, that was certainly a very operative factor.

Q. You may have misunderstood me.

A. Okay.

Q. I wasn't suggesting that this criterion applies to cigarettes. I was suggesting it does not apply.

A. I understand that.

Q. All right.

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A. But your characterization was that that was because it was read -- readily available, and what I'm trying to say is that it's more than the fact that it's readily available. There's a fundamental difference between cigarettes and drugs of abuse.

Q. One of the reasons that this criterion doesn't apply is that smokers don't have to spend a great deal of time to obtain the substance. It's readily available; isn't that true?

A. And what I'm trying to say is one of the big differences here is that there is no intoxicating or function change that results in crime, that results in a poor judgment that makes one lose control in the context that has been used in classical drugs of abuse, and intoxication is a key criteria in that definition.

Q. The sixth criterion says that important social, occupational or recreational activities are given up or reduced because of substance abuse. Does Philip Morris believe that that criterion applies to cigarette smoking behavior?

A. No.

Q. Why is that?

A. I think smokers do what everybody else does. I don't see any evidence that smokers don't partake in

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similar act -- social, occupational or recreational activities as anyone else.

Q. To the extent that a smoker in a smoke-free office building has to go outside to smoke, you've seen that, haven't you --

A. Due to --

Q. -- in your daily life?

A. Due to regulations, not due to smoking.

Q. Without regard to what the cause is, the fact is that in order for a cigarette smoker to smoke in a smoke-free environment, they have to leave that environment?

A. What you just --

Q. Is that right?

MR. FOWLER: Object to the form. Object to the form of the question.

A. What you just said, not regard to the cause, what you're saying is the regulation is the substance of dependence because that is causing that behavior, not smoking.

Q. Referring to this definition, if a smoker leaves his or her desk at his or her workplace --

A. Uh-huh.

Q. -- to go outside to smoke a cigarette and they do that four or five times a day, they are giving up

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some aspect of their occupational activity, are they not?

A. Because of a regulation.

Q. I don't care why they're doing it. Are they doing it?

MR. FOWLER: Object to the form of the question. And --

THE WITNESS: Are you finished?

MR. FOWLER: No. Go ahead -- go ahead and read the -- the criteria again and see if you can answer the question.

A. "Important social, occupational, or recreational activities are given up or reduced because of substance use." I don't see that in smokers, as I've already indicated, and I don't find that your example of going to the street corner is operative in this definition because it does not indicate that a smoker does not do important social, occupational and recreational activities. They still work. They still go to social activities, and they still perform recreational activities.

So the regulation is driving the person to the street corner, not smoking.

Q. If I make the decision that my home will be smoke free, not because of a regulation, but because

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I choose it --
A. Right.
Q. -- and I invite you, Dr. Ellis, over to my home and let's say you smoke for purposes of this example.
A. Okay.
Q. And I say to you, "You're most welcome in my home, but for purposes of your visit, if you're going to smoke, I would ask you to go outside in the back yard and smoke." While the rest of the party that you're attending goes on --
A. Uh-huh.
Q. -- you're missing out on some aspect of that social occasion to go in the back yard and smoke, are you not?
MR. FOWLER: Object to the form. It's an incomplete hypothetical.
Q. Assuming the party's indoors to begin with --
A. And it's -- and it's important.
Q. -- to complete the hypothetical.
MR. FOWLER: Same objection.
A. And it's important. I think --
Q. Well if I extend the invitation, it will be important --
A. It will be important.
Q. -- I assure you.

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A. I -- I would appreciate that.

I think -- I think the key here is important quite frankly, and -- and not that that isn't important, but the key here means that you lose control or -- of normal function because of the substance per se within this definition. And again if you read that criteria, it's very clear that it's important social, occupational or recreational activities are given up or reduced.

Going out for a cigarette on a street corner does not mean you can't perform a job or attend a party or perform a recreational activity. It means that in the context of what you do, whether you go to have a cup of coffee or you go to have a cigarette or you go to lunch, there are times when you take breaks and you partici -- participate in various social -- other social functions. And I think it's best characterized that way and not characterized as deviant behavior.

Q. You have seen studies of smokers that indicate that people continue to smoke even after they've had a serious or life-threatening illness. You've seen those studies, have you not?

A. I've seen indications in the literature that some people choose to smoke under those

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circumstances.

Q. Okay. Take a look at the seventh criteria under DSM-IV. It reads "the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance ...." Do you see that?

A. Yes.

Q. Does Philip Morris agree that that is a proper criterion in order to evaluate whether cigarette smoking behavior produces dependence?

A. It's one of the criterion that's in DSM-IV. What is the proper criteria I think is right now up to debate, and it certainly isn't Philip Morris's position to establish criteria in this area.

However, I think it is Philip Morris's position to -- to go through these and to discuss these in the context of what we know about the product and the people that use it, and that's what I'm trying to do. And I can -- I recognize that there can be different interpretations, but I'm trying to provide information here in terms of a fair assessment of how smoking may relate to each of these criteria.

Now the substance use is continued despite knowledge of having a persistent or recurrent

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physical and psychological problem. Certainly certain people do continue to smoke after they have been diagnosed by -- with some disease; however, whether or not that particular disease was caused by smoking, as we discussed earlier, is another -- another key question. There are people that continue to smoke, but there are many, many more, many more, that have quit successfully.

Q. I'm not suggesting that Philip Morris should be setting --

A. Thank you.

Q. -- the standards or the definition, but we are entitled to know -- and this is why I ask the question --

A. Right.

Q. -- what Philip Morris believes is the proper definition.

Does Philip Morris believe that this criterion that substance -- that the substance is used even in the face of serious illness related to the substance, is that a proper criterion for establishing substance dependence?

MR. FOWLER: Object to the form of the question.

A. I think I already described a position whereby

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certain individuals will continue to smoke. Whether or not that's due to a, quote, "substance" or due to the fact that they are -- and like smoking is a different situation, and there could be a behavioral or psychological dependence that is -- is -- and they choose to continue to smoke under those circumstances.

So I think that it is not something that we can sit here and say, "It is this" or "It is that." I recognize that many people have smoked, far more people -- I'm sorry. I recognize that many people have quit smoking, far more people probably than are in this category described by criteria number (7).

Q. So Philip Morris does not believe that that criteria should apply to the definition of substance dependence?

A. Again I'm not in a position to set criteria. I'm in a position --

Q. I'm asking about the company's beliefs, ma'am, not setting criteria. I just want you to be clear about the question.

A. And -- and I think you're asking me to make a value judgment on whether or not this criteria should describe substance dependence. I don't think Philip Morris is the American Psych -- Psychiatric Society

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or the American Pharmacological Society or anybody else.

I think that what we can do, though, is go through these criteria and try to represent what we understand of the smoking population as they relate to these criteria.

Q. Put another way, is Philip Morris deferring to organizations such as the American Psychiatric Association in setting the criteria for what is substance dependence?

A. Certainly no consumer products company would be in the position to set criteria for anything like this. Again, as I indicated before, regulatory agencies set criteria for many different things for everybody, and it needs to be that way; otherwise, you have different criteria.

I think the issue here is that Philip Morris needs to work within what is being defined and to look at the product -- I'm sorry, you're --

Q. Go ahead.

A. And to look at the product in the context of any definition that is put forth.

Q. Does Philip Morris believe that it's in a position to define what the criteria for substance dependence are as they relate to cigarette smoking?

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MR. FOWLER: Object to the form of the question. If you understand it, you can answer.

A. I don't -- I think you're asking me to -- to set criteria.

Q. And you don't want to?

A. I don't think it's appropriate, no.

Q. Does Philip Morris have any view as to what the proper criteria for the definition of substance dependence should be other than the one you expressed earlier?

A. I think that is the opinion, and that is the quantitative factors that can be measured. I think these, as we've gone through them, there are a continuum of situations that can be observed in each of these criteria and -- and a continuum for different materials and a continuum for different people. And I think that then makes it very difficult to classify any substance or individual within these criteria.

Q. Please turn to page 243 of Exhibit 1328. At page 243 there is a section entitled "Nicotine Dependence." Do you see that, ma'am?

A. Yes.

Q. It refers in the first few lines back to the section we were just in earlier in this document, but

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I'd like to refer you to the third sentence, which reads "Tolerance to nicotine is manifested by the absence of nausea, dizziness, and other characteristic symptoms despite using substantial amounts of nicotine or a diminished effect observed with continued use of the same amount of nicotine-containing products."

A. Yes.

Q. First question: Does Philip Morris believe that that's a proper definition of tolerance?

A. To peripheral effects, yes, as I described earlier.

Q. Peripheral nervous system effects?

A. Well yes, mediated by that potentially, but peripheral nervous system effects can include other criteria than those listed here; for example, blood pressure and heart rate.

Q. Okay. So this is a proper definition for those aspects of nicotine that do not involve the brain; is that a fair statement of it?

MR. FOWLER: Object to the form.

A. Well, they may. Certainly dizziness and nausea may involve the brain. I'm not -- don't want to represent that they don't, but certainly people do not smoke or do not take nicotine via gum or patch to

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achieve nausea or dizziness.

Q. With that clarification, is this definition one that Philip Morris accepts; that is, the definition of tolerance as used here?

MR. FOWLER: Object to the form of the question.

A. For peripheral effects.

Q. All right.

A. Not in the context of the criteria that we showed back over here, because that specifically stated to intoxicating effects or desired effects, and dizziness and nausea are not desired effects.

Q. Okay.

A. Okay.

Q. The next sentence reads "Cessation of nicotine use produces a well-defined withdrawal syndrome that is described below." Does Philip Morris agree with that statement?

MR. FOWLER: If it's necessary for her to refer below, can she do that --

MR. SILBERFELD: Of course.

MR. FOWLER: -- to answer that question? Okay.

Q. It's actually the next sentence, ma'am.

A. Well it's the table, "Diagnostic criteria for

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292.0 Nicotine Withdrawal."

Q. You're over one page on page 244.

A. That's correct.

Q. If you'd like to use that table, we can use that instead.

A. Okay. It says "dysphoric or depressed mood; insomnia; irritability, frustration, or anger; anxiety;" and "difficulty concentrating."

Q. It actually goes on on page 245.

A. Thank you, "(continued)." "Restlessness; decreased heart rate; increased appetite or weight gain."

Q. And four or more of those have to be present in order for --

A. And it --

Q. -- nicotine withdrawal to be present?

A. And it states in C that "The symptoms in Criterion B cause clinically significant distress or impairment in social, occupational, or other important areas of functioning," and I think that's key. I think that while some of those symptoms certainly can be used to characterize people that are stopping a behavior that they're used to performing, I think that the issue here is clinically. I think that because, as is stated in the Surgeon General's

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report, 95 percent of smokers have quit with no assistance, this is not a clinical syndrome as such per se.

Q. All right. If you will turn back, if you're not there, to page 243.

A. Yes.

Q. Thank you.

The second-to-last sentence in the section under nicotine dependence reads as follows: "Giving up important social, occupational, or recreational activities can occur when an individual forgoes an activity because it occurs in smoking-restricted areas." Do you see that?

A. Yes.

Q. Does Philip Morris agree with that statement?

A. Giving up important social, occupational or recreational activities. I think that if you characterize smokers, they function normally. I think if you had an airline pilot that smoked, that you would feel comfortable. I don't think that's giving up important occupational activities.

I think people do function normally when they -- as smokers, and so therefore I don't -- I don't believe that this is -- especially with the key word "important" is characterizing the situation

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correctly.

Q. Okay. Thank you. I'm finished with that document.

MR. SILBERFELD: Let me have marked as plaintiffs' next in order a document entitled "THE CURRENT SITUATION OF SMOKING AND HEALTH, April 1974." It bears Bates number 2028635795 through 5847.

(Plaintiffs' Exhibit 1329 was marked for identification.)

BY MR. SILBERFELD:

Q. Dr. Ellis, have you seen this document before?

A. I would have to go through this and see. I'm not sure.

Q. Let me pose a different question.

A. I -- I don't -- I don't recall seeing this before.

Q. Is this one of the 25 or so documents you looked at?

A. No, I don't believe so.

Q. All right.

A. Again I don't recall seeing this, nor do I know who would have authored it.

Q. At the bottom of the first page there's the writing "PME RESEARCH LABORATORY." Do you know what

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that refers to, ma'am?

A. Yes, Philip Morris Europe Research Laboratory.

Q. Okay. And this appears to be a report of some kind about what was known in the literature about the issues of smoking and health as of this time, April 1974. Is that a fair characterization of it?

A. Based on what I've seen, yes.

Q. Okay. And was it the practice within Philip Morris either in the United States or Europe or elsewhere to periodically write reports assessing the current state of the scientific and medical knowledge on various topics?

A. I have seen some over the years, but not regularly. I would want to characterize it that way.

Q. All right. Turn, if you would, to page 28 of the document. The numbers appear in the upper right.

A. Yes.

Q. Do you see that, ma'am?

A. Yes.

Q. In the middle of that page there is the sentence underlined that reads "It was concluded that smoking deprivation" produces "definite signs of withdrawal effects." Do you see that?

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A. That's what it says.
Q. Do you have any reason to believe that that point of view was not the prevailing view within Philip Morris in April of 1974?
A. I have reason to believe that in April 1974 this was generated in a research laboratory and was not necessarily the prevailing view throughout the company, that's correct, if that's what you're saying.
Q. That's what I'm asking.
A. Right.
Q. Was it the prevailing view?
A. Not to my knowledge, no.
Q. Was there a controversy within the company as to whether or not smoking deprivation produces definite signs of withdrawal effects as of that time?
A. It was not the prevailing view, and subsequent to that, with Dr. DeNoble's documents, basically there's a lot of discussion in this area that counters what I have seen so far in this.
Q. At page 32 of the same document at the bottom of the page again underlined --
A. Uh-huh.
Q. -- there is the statement "If nicotine is the addictive compound in the tobacco smoke," cigarettes

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"with low content of nicotine may even be more dangerous than usual cigarette, due to their supposed higher degree inhalation, according to Astrup." Did I read that correctly?

A. Yes.

Q. Did Philip Morris believe as of April 1974 that nicotine was the addictive compound in tobacco smoke?

A. No.

Q. You've seen the word "addictive" or "addiction" used within company documents other than this one, have you not?

A. Yes.

Q. You can put that aside, but we're going to come back to it at another point.

Do you know a Dr. William Dunn?

A. Yes.

Q. And who is Dr. Dunn?

A. Dr. Dunn was an individual who worked in R&D for a number of years.

Q. And do you know a person by the name of Carolyn Levy?

A. Yes.

Q. And who is Carolyn Levy?

A. Carolyn Levy currently is a senior vice

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president of marketing and sales information.

Q. At some point in time did Carolyn Levy in the 1970s, late 1970s, work in research?

A. Yes.

Q. Let me show you what's been previously marked as Plaintiffs' Exhibit 392. Have you seen this document before, ma'am?

A. Yes.

Q. Was this one of the 25 or so documents you reviewed in preparation for today?

A. Yes, over -- over the years, not specifically for today, but --

Q. All right. This is an interoffice correspondence from Ms. Levy to Dr. Dunn dated November 1, 1977; is that right?

A. Yes.

Q. And she writes in the first paragraph that there is a controversy in the literature over whether or not a withdrawal symptom is evident when cigarette smokers stop smoking. Do you see that?

A. Yes, I see that.

Q. And there's a literature reference to Schachter --

A. Yes.

Q. -- and others; right?

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A. Yes.
Q. In the interest of time, let me see if I can summarize.
What Ms. Levy proposed to do was to study the effects of nicotine withdrawal in laboratory animals; right?
MR. FOWLER: Object to the form of the question.
A. She attempted to set up an experiment to -- to study that, yes.
Q. And she says in the third paragraph, first line, "If nicotine withdrawal effects do exist, then they should be observable using an animal model." Do you see that?
A. She states that.
Q. Did Ms. Levy carry out her study?
A. She certainly tried to set up an animal model.
Q. Did she complete the work?
A. She tried to set up an animal model; however, her -- my understanding after speaking with her, her results were very variable, are in her notebook, and she was unable to get reproducible results.
Q. In order for Ms. Levy to do the work, she needed the approval of Dr. Dunn, did she not?
A. Yes, she did.

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Q. And she obtained that approval, did she not?
A. I believe so because she performed the work.
Q. And Dr. Dunn in turn reported the fact that Ms. Levy was going to do this work to Dr. Osdene. Do you recall that?
A. I was not there, so I don't specifically recall that.
Q. Well in 1977 who was Dr. Osdene?
A. Dr. Osdene most likely was the director of research.
Q. Dr. Dunn's boss at the time?
A. That's correct.
Q. Let me show you what's been previously marked as Exhibit 1529.
A. Yes.
MR. FOWLER: Thank you.
Q. Exhibit 1529 is a memo from Dr. Dunn to Dr. Osdene dated two days after Ms. Levy's memo; is that right?
A. That's correct.
Q. And the subject line of the memo is the proposed study by Levy. That's Carolyn Levy?
A. That's correct.
Q. And what Dr. Dunn is writing to Dr. Osdene here is that he has given approval to proceed with this

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study; right?

A. That's what the first sentence says, yes.

Q. And then it reads "If she is able to demonstrate, as she anticipates, no withdrawal effects of nicotine, we will want to pursue this avenue with some vigor." Have I read that correctly?

A. That's what the memo says.

Q. It goes on. "If, however, the results with nicotine are similar to those gotten with morphine and caffeine, we will want to bury it." Do you see that?

A. That's what the memo says.

Q. "Accordingly," it goes on, "there are only two copies of this memo, the one attached and the original which I have." Have I read that correctly?

A. That's what it states on the memo. Obviously I am very sure there are many more copies of this now.

Q. I'm sure there are now. There are at least four on this table.

A. Right.

Q. But as of 1977, was it the practice within Philip Morris to keep only selected copies of certain memoranda?

A. Obviously --

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MR. FOWLER: Object to the form of the question.

A. Certainly because this memo exists and the data from Carolyn's experiment exists, I find it hard to relate to what is stated on this memo with the practice at Philip Morris.

Q. How long as of 1977 had Dr. Dunn been at Philip Morris?

A. Had Dr. Dunn been at Philip Morris?

Q. Yes, ma'am.

A. I would say I believe he came around 1973 or -- no, the '60s, excuse me, so he had been there for quite some time.

Q. Ten years or more?

A. Yes.

Q. And are you aware -- well I'll withdraw that, if I may.

Is this document one of the ones you looked at in preparation for today?

A. Not that I can recall specifically, no.

Q. But you've seen it before today?

A. Oh, definitely.

Q. Have you ever done any investigation on behalf of the company in order to determine the facts and circumstances surrounding the statement that if the

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results are that nicotine is similar to morphine and caffeine, quote, "we will want to bury it," close quote?

A. Yes.

Q. Have you ever --

A. Yes.

MR. FOWLER: Object to the form of the question.

A. Yes, I have investigated. As I indicated, I spoke to Ms. Levy herself, and she indicated to me that she was surprised at the memo. She, I don't think, was aware of it at the time, in 1977, that she did the study and recorded it in her notebook. It still is in her notebook and I did review the notebook, and that the results were variable and she was never able to set up the model with the positive con -- compounds that were mentioned in the proposal.

Q. If the withdrawal effects of nicotine were similar to those of morphine and caffeine, that would have negative implications, would it not, for the cigarette business?

MR. FOWLER: Object to the form of the question.

A. Well, I think that one would have to see the

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study and determine exactly how representative the study was of the human situation. Because of doses and because of other differences with animals and humans, I can't make that judgment.

Q. As of 1977, Philip Morris was a member of the Council for Tobacco Research, was it not?

A. Yes, I believe so.

MR. SILBERFELD: Let me have marked as next in order a multipage document titled "PROSPECTIVES FOR CTR IN RELATION TO CNS STUDIES" bearing Bates number 2057769088 through 9094.

MR. FOWLER: Thank you.

(Discussion off the stenographic record.)

(Plaintiffs' Exhibit 1330 was marked for identification.)

BY MR. SILBERFELD:

Q. This document, Dr. Ellis, produced by Philip Morris is a CTR document but came from the files of Philip Morris. I'll represent that to you. And I'd like to direct your attention to the last sentence in the first paragraph of the document, and that's the only question I have about it.

MR. FOWLER: If I could just ask, do you know who made the -- the marking on this, the handwritten markings?

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MR. SILBERFELD: I don't, except to say that it wasn't us.

MR. FOWLER: Okay.

Q. The sentence I'm focusing on at the lower third of that first page, Dr. Ellis, reads "Further, the dependence which develops to tobacco in humans," parentheses, "(plus withdrawal symptoms during cessation of smoking)," close parentheses, "and the degree of tolerance to nicotine which occurs in certain animal paradigms strongly suggest that nicotine is an habituating agent." Do you see that, ma'am?

A. That's what the document says.

Q. I've read that correctly?

A. Yes.

Q. Was this one of the documents you looked at in preparation for your testimony?

A. I do not recall this document.

Q. As of the date, November 22, 1977, which is shown at the top, Philip Morris understood that in fact a dependence develops to tobacco in humans based on this document and perhaps others?

MR. FOWLER: Object to the form of the question.

A. I again think that because of what I know

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occurred subsequent to 1977, I would not agree that Philip Morris knew that dependence develops to tobacco in humans.

Q. Philip Morris knew as of this time, in November of 1977, that withdrawal symptoms occur from cessation of smoking?

MR. FOWLER: Object to the form of the question.

A. I -- I think that to characterize the CTR document by some author that I don't even know as being representative of what Philip Morris knew in 1977 is -- is a bit broad.

Q. In fact, Philip Morris and the rest of the tobacco companies used The Council for Tobacco Research to conduct research on issues of smoking and health, nicotine and addiction, did they not?

MR. FOWLER: Object to the form of the question, in particular the phrase "used" -- or the word "used."

A. My experience and currently in my review of the documents indicate that there was certainly not a use of CTR in the context of research and development using CTR. Money was put into CTR and a group of scientists did fund certain proposals. So in that context, I don't think that's a fair

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characterization.

The other thing I don't think is a fair characterization is we did our own work in some of these areas, and so to say that we used them to do that work and to connote that is incorrect.

Q. Do you see the name at the top of the page, Donald H. Ford?

A. Yes, I do see that.

Q. Do you know who Donald H. Ford is?

A. No, I don't.

Q. Okay.

MR. SILBERFELD: Let me have a break.

MR. FOWLER: Thanks.

THE REPORTER: Off the record, please.

(Recess taken.)

(Plaintiffs' Exhibit 1331 was marked for identification.)

BY MR. SILBERFELD:

Q. Dr. Ellis, if I may, we've put before you Exhibit 1331, and the immediately prior exhibit, which was the CTR report that we spoke about which bore the name Donald Ford and the date, November 22, 1977, I think there's probably a relationship between these two documents, which is why I want you to look at them together.

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Exhibit 1331, the one currently before you, is a memorandum from Dr. Osdene to Dr. Seligman; right?

A. Correct.

Q. And it's dated November 29, 1977; right?

A. Correct.

Q. And it reports, does it not, a meeting about a CTR program attended by Dr. Osdene? And that's the prior exhibit that we were talking about. The meeting occurred about a week before; correct?

A. I'm trying to find the meeting part.

Q. Well the subject line says "Some Comments about the CTR Program." Do you see that?

A. Yes.

Q. And in the second line of the text, do you see Dr. Ford's name?

A. Yes. Whether or not that means there was a meeting or not, I'm not sure.

Q. Okay. Now with regard to this memo, it starts out by Dr. Osdene telling Dr. Seligman that he was amazed at the trend that the CTR work is taking; is that correct?

A. That's what the first line says.

Q. And he reports that Dr. Ford, a new staff member, made the following quotes, and then he lists the quotes; right?

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A. That's right.
Q. The first quote is that "'Opiates and nicotine may be similar in action'"; right?
A. That's the first quote.
Q. The second quote is that "'We accept the fact that nicotine is habituating'"; right?
A. That's the second quote.
Q. And the third is that "'There is a relationship between nicotine and the opiates'"?
A. And that's the third quote.
Q. Those views as expressed by Dr. Ford as of November 1977 were extremely troubling, were they not, to Philip Morris?
MR. FOWLER: Object to the form.
A. I think that over the years that Philip Morris has looked at the literature, has looked at what other people have said, and you will find those things reflected in -- in our documents. Troubling or -- or not, I don't think that's the issue.
I think that what -- what is the issue is that we certainly looked at the gamut of what the thought processes were out there, the theories that were out there, and we certainly represented most of that information in our documents through literature reviews and through quotes and through understanding

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what other people thought.
Q. As of this time, though, in November of 1977, these views as expressed at the CTR meeting or program were viewed by Philip Morris as potentially causing great damage to the tobacco industry; --
MR. FOWLER: Objection to the form.
Q. -- isn't that true?
MR. FOWLER: Sorry. Object to the form of the question.
A. Well I'm not aware that -- you know, the CTR program was a program separate, and this memo does not represent to me that there was a special meeting that Dr. Osdene attended. It seems to me like he was focusing on doc -- Dr. Ford's quotes and expressing his viewpoints on them.
Q. Without regard to whether there was an actual formal meeting or not, Dr. Osdene concluded as of this time, in November 1977, that Dr. Ford's views had the potential for causing great damage to the tobacco industry; isn't that right?
MR. FOWLER: Object to the form of the question.
A. Yeah, I -- I think that he is expressing a concern relative to some of these quotes. Exactly the nature of Dr. Osdene's concern I certainly would

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not want to hazard a guess relative to the words that are on this piece of paper.

Q. Well from your reading of it, you would certainly agree that what Dr. Osdene was expressing here was grave concern about the future of the tobacco industry; isn't that true?

A. I don't see those words exactly.

Q. He says in the last paragraph -- and you tell me if I've read this correctly --

A. Uh-huh.

Q. -- "It is my strong feeling that with the progress that has been claimed, we are in the process of digging our own grave."

A. That's what it states.

Q. It goes on "I believe" --

A. Uh-huh.

Q. -- "that the program as set up has the potential of great damage to the industry and I strongly urge that the whole relationship of our Company" -- that's Philip Morris; right?

A. Yes.

Q. And -- or "to CTR be carefully reviewed. I am very much afraid that the direction of the work being taken by CTR is totally detrimental to our position and undermines the public posture we have taken to

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outsiders."

Have I read that correctly?

A. That's correct, and my position on that relative to the situation I understand is that that, if it -- if it represents Dr. Osdene's feelings at the time, that's what it does, but certainly I have seen no indication of a change in practice relative to these comments.

Q. As of 1977, Philip Morris's public position was the opposite that -- of the proposition stated here that nicotine is habituating; isn't that true?

MR. FOWLER: Object to the form of the question, but if you understand that, you can answer it.

A. Yeah, I don't -- I think again, as I represented, that if you look at the literature at any given time, you will find any specific quote that you want to find. I think that scientists will have in the documents their ideas and will represent a number of different hypotheses. That doesn't mean those are proven. It means that they are ideas and they are trying to determine whether or not they are true.

I think that the outside literature and the internal literature reflect a multitude of ideas, and

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none of those necessarily is the Philip Morris -- Philip Morris opinion at any one given time. The function of an R&D and research and development department is to look at that information and to look at the breadth of that information, and if we had all our documents saying that nobody thought that, quote, "We accept the fact that nicotine is habituating," we would be, I think, living in another world. And I think that because our documents represent some of the statements that are being made outside is positive and is recognition of the fact that we have looked at the literature, that we do relate to the scientific community and that we do meaningful research.

Q. In the last sentence of the memo, Dr. Osdene refers to "the public posture we have taken to outsiders." Do you see that, ma'am?

A. The last paragraph?

Q. The last line.

MR. FOWLER: The last line of the last paragraph.

A. Oh, yes, I'm sorry.

Q. Where it says "the public posture we have taken to outsiders," do you see that?

A. It says that, yes.

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Q. As the representative of Philip Morris here today, referring back to this time frame in 1977, what was the public posture the company took to outsiders?

A. In 1977 there were warning labels on every pack of cigarettes. I don't understand the statement.

Q. Was there a warning label on cigarettes that had to do with the effects of nicotine in 1977?

A. As I recall, there were warning labels that certainly would relate to general effects of smoking, which would include nicotine.

Q. Was there any warning label that even suggested in the broadest sense that nicotine might be habituating?

A. Not to my knowledge, no.

Q. Was there any warning label extant in 1977 which talked about nicotine being capable of producing dependence or addiction?

A. As I indicated before, Congress set those warnings and it was done based on the information I think that was gathered from the scientific community.

Q. Okay. Can you answer my question.

A. I said those --

MR. FOWLER: Object to form.

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A. -- those were not present. However, I also said that that -- what the warning labels said was dictated by an act of Congress and basically that we were preempted at that time from any additional change to those labels and still are.

Q. The warning labels existing as of 1977 --

A. Yes.

Q. -- did not provide in any respect that nicotine was capable of producing dependence or addiction?

A. The warning labels did not specifically address that; however, they addressed a number of related issues.

Q. To the extent that the cigarette label warnings did not talk about the effects of nicotine in terms of habituation, dependence or addiction, what public posture was Dr. Osdene speaking of?

A. I believe I've already answered that I don't understand it based on the fact that the warning labels were on all the packs. I don't understand. The public posture was certainly most noticeable relative to those warning labels, and the public posture he is referring to, I don't know what he's referring to.

Q. When you joined the company yourself three years after this time, in 1980, did you come to know

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Dr. Osdene?

A. Yes.

Q. And did you work with him or in the same general area of the business --

A. Well --

Q. -- for some period of time?

A. He was the director of research and I was in research. However, I did not have a daily contact with him.

Q. For how long did you two work together in the broadest sense?

A. I believe he left about 1984 time frame. No. Yeah. Well he -- he left to -- actually I think it was '86 he moved to be the vice president of science and technology for a period of time. So up until that period of time, he was present physically in the area that I worked; however, like I said, there was not day-to-day contact.

Q. Did you come to know him in terms of his temperament and personality in that four-year period?

A. Yes.

Q. Did you find him in that four-year period to be a person prone to alarmist or shocking statements?

A. I wouldn't characterize him as such; however, I

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think he was certainly a -- a -- an individual. I'll say that.

Q. Reading this document, Exhibit 1331, would you agree that the tone of it, especially the tone of the last paragraph, suggests alarm on the part of Dr. Osdene?

MR. FOWLER: Object to the form.

A. I would not want to hazard a guess what it suggested or what he was thinking at the time.

Q. In the four years that you knew Dr. Osdene in research and development, did you ever know him to use the phrase "digging our own grave"?

A. I don't recall him saying that to me, no.

Q. Do you recall him ever using the term "great damage to the industry," referring to the tobacco industry?

A. I certainly don't recall that either.

Q. Let me refer you back to 1331 for one more series of questions. In the second paragraph it refers to Dr. Leo Abood, A-b-o-o-d. Do you see that, ma'am?

A. Yes.

Q. And it says "Dr. Leo Abood, whose presentation showed a high degree of competence ...." Do you see that?

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A. Yes.
Q. Does that suggest to you that Dr. Osdene actually attended a meeting where formal presentations were made by individuals?
A. Either that or he was commenting on a report from a meeting. I'm not sure. I don't think it's clear.
Q. All right. And it goes on to say that Dr. Abood has as -- has one of his aims a specific antagonist to nicotine. Do you see that, ma'am?
A. Yes.
Q. What is an antagonist as used in this context?
A. An antagonist would be something that would counter the effects of nicotine in the context of this sentence.
Q. Let me put before you Plaintiffs' Exhibit 1524, previously marked. It is an interoffice memo from Dr. Osdene to file dated January 10, 1978; is that right, ma'am?
A. Yes.
Q. This is about two months or so after the prior memo of Dr. Osdene that we just spoke about, Exhibit 1331; right?
A. Yes.
Q. Direct your attention, if I may, to the bottom

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of the page, the last paragraph. It reads "Dr. Seligman brought up the grant by Dr. Abood in which one of the stated aims was to make a clinically acceptable antagonist to nicotine. This goal would have the potential of putting ... tobacco manufacturers out of business." Have I read that correctly?

A. That's what the paragraph says.

Q. Is this one of the documents you reviewed in the course of your preparation for today?

A. I recall this document, but I have not reviewed it recently.

Q. It reflects, to use plain language, that if Dr. Abood was successful in producing an antagonist to nicotine, that that would have a detrimental effect on the tobacco business; right?

MR. FOWLER: Just a second.

A. The paragraph seems to imply that.

Q. If someone were to develop a substance to counter the effects of nicotine, that would be negative, a bad thing, for the tobacco business. That's what this says; isn't that true?

A. I find it interesting based on what I know occurred after this, but that's potentially what is being intended by this con -- by this paragraph. I'm

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not sure.

Q. And as of 1978, at this time, nicotine in cigarettes was a crucial and important element in the tobacco products that Philip Morris sold; isn't that true?

MR. FOWLER: Object to the form of the question.

A. Well a decade later we sat -- sought to, you know, de -- denicotinize tobacco, so in the context of that and in the context of the work that was done subsequent to this memo on the nicotine analogs, which is countered to the antagonist piece of this, I just -- I -- I find it hard to relate to and I'm not aware of this going any further than what I see here.

Q. I need to move to strike the answer as nonresponsive.

Let me show you, Dr. Ellis, the stack of documents we're going to talk about.

A. Uh-huh.

Q. They run from where we are right now, --

A. Uh-huh.

Q. -- in 1978, through 1994.

A. Uh-huh.

Q. I want to assure you that to the extent you want

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to explain an answer, you'll have an opportunity to do that.

A. Okay.

Q. In 1978 was nicotine a crucially important element of the tobacco products that Philip Morris sold?

MR. FOWLER: I'm going to object to the form of the question, in particular the preamble, but you can go ahead and answer the question.

A. I think that nicotine -- in terms of characterizing it, nicotine is a natural component of tobacco. We have found that nicotine has sensory aspects to smoking. In 1978 I think that we were learning about the importance of nicotine relative to the sensory aspects and probably best learned about it in the denic -- denicotinized product, so I think our knowledge evolves and evolves with more information and time.

Q. In 1978 was nicotine a crucially important element of the tobacco products that Philip Morris sold?

MR. FOWLER: Objection, asked and answered.

A. In 1978 the knowledge base that we had at that time, I don't think that was determined. That's why

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we went and sought to do denic.

Q. It wasn't known?

A. It was not --

Q. Is that what you're saying?

A. It was not certainly established in any way and still is not established necessarily because we have cigarettes that deliver very low levels of nicotine.

Q. If nicotine as of 1978 was not a crucially important component of the cigarettes that Philip Morris sold and Dr. Abood went about developing a clinically acceptable antagonist to nicotine, why would it have had any effect on Philip Morris's tobacco sales?

A. Well I think that's a hypothetical that's put down here, and I think it is a very, very significant hypothetical. Dr. Abood is a classic scientist in terms of nicotine work, and I would not be surprised that anybody that could establish an acceptable antagonist to nicotine would be doing significant work in terms of studying the autonomic nervous system.

Q. The only way an antagonist to nicotine would matter to Philip Morris in 1978 is if nicotine was the mainstay of the tobacco products that the company sold. It's only in that way that the company could

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suffer the potential of going out of business; right?

MR. FOWLER: Yeah, object to the form of the question.

A. I -- I think that's completely hypothetical and based on what I know has occurred post this, the date of this memo.

Q. I need you to stay in the time frame, if you would.

A. Uh-huh.

Q. As of this time, the only way that the development of an antagonist to nicotine would cause Philip Morris's tobacco sales to drop off or stop would be because nicotine is a crucially important element of the tobacco products; right?

MR. FOWLER: I'm going to object to the question, and if I might just explain, you asked --

MR. SILBERFELD: Explain away.

MR. FOWLER: -- you asked her to stay in the '78 time frame, but then you asked the question in the present tense, nicotine is crucially important. I think that might be the source of confusion.

MR. SILBERFELD: Okay. I'm pleased for the advice.

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A. Let me try --
Q. Let me restate it.
A. Okay.
Q. As of this time, in 1978, --
A. Uh-huh.
Q. -- isn't it true that the only reason a nicotine antagonist could have the effect of driving Philip Morris out of the tobacco business is because of the crucially important role nicotine plays in those tobacco products? Isn't that true?
A. Let me explain scientifically why that's not true.
Q. You can answer it "yes" or "no," and then I'm pleased to have you explain.
A. It's not true.
Q. It's not true. Why not?
A. Because a clinically acceptable antagonist, how would that be used? If you were going to then use an antagonist to the effects of nicotine in smokers, then under the hypothesis that nicotine is so critical, then you would be blocking the effects of nicotine. And the subsequent thing is, under your premise that nicotine is so important, that people wouldn't use the antagonist if that is your premise.
So in the context of the argument that he's

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placing here, he's actually saying it isn't that important because the nicotine antagonist may indeed be a valuable tool in the -- in the market. So technically in terms of how an antagonist would be used in the context of a cigarette, you would counter the effects of nicotine. So if it's so important, then I don't think people would use it.

Q. Let me put before you a previously marked exhibit, Exhibit 386.

MR. FOWLER: Thank you.

Q. It is a letter dated March 15, 1978 on the letterhead of Philip Morris USA from Bill Dunn to a Mr. Jack Hind, H-i-n-d. Do you see that, ma'am?

A. Yes.

Q. As of 1978, was Dr. Dunn still with the research and development department?

A. Yes.

Q. Okay. And was it understood as of 1978 that nicotine in cigarettes has reinforcing properties to and for the smoker?

A. By 1978 there were some reports in the literature, initial reports in animals with self-administration studies.

Q. And did Philip Morris as of this time accept those reports as establishing nicotine

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reinforcement?

A. Under the conditions of those experiments, those were in the literature, and we subsequently, as you well know, set out to do our own studies.

Q. As of this time in 1978, did Philip Morris believe that the animal work on reinforcement of nicotine was such that an inference could be drawn for the human experience; that is, that nicotine was reinforcing in humans?

A. Potentially an inference could be made if you were using similar types of exposure levels and situations; however, even forgetting the fact that this is an animal study, it is widely recognized in the scientific community that positive reinforcement in itself is not sufficient -- sufficient criteria for any kind of, quote, "addiction or dependence or habituating scenario"; potentially habituating, but certainly not addiction and dependence.

Q. Dr. Dunn writes to Mr. Hind at the bottom of the first page, quote, "As for the nicotine reinforcement, we are beginning to suspect that rather than there being an attempt to maintain some blood constancy level, the smoker is seeking the spike effects of blood nicotine which occur immediately upon inhalation. These effects may well

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be so rewarding that the habitual smoker overloads himself in seeking them, with high blood nicotine levels occurring after the fact, and not essential to the reinforcement process." Do you see that?

A. I see that's what the paragraph states.

Q. Have I read it correctly?

A. Yes.

Q. And in fact, is this paragraph a true statement of what Philip Morris believed about nicotine reinforcement in humans as of 1978?

A. No. He is stating "we are beginning to suspect," so it is an idea that's being put forth and has received considerable study subsequent to that and still does.

Q. Let me show you what's been previously marked as Plaintiffs' Exhibit 1515.

MR. FOWLER: Thank you.

Q. It is a multipage document, a memo from C. J. Levy and L. Carron, C-a-r-r-o-n, to Dr. Dunn, and the subject is "Activity Study" and the date is December 10, 1979.

Do you see that, ma'am?

A. Yes.

Q. As of December of 1979, was Philip Morris satisfied that nicotine produced tolerance?

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A. The -- was that nicotine produced tolerance per se?
Q. Or that nicotine administration attributed -- could be attributed to the development of tolerance.
MR. FOWLER: Object to the form.
A. If you could just give me a second to read this for a second.
Q. Of course.
(Witness reviews Plaintiffs' Exhibit 1515.)
A. The memo states that "These results suggest that the effects seen in the first study" are "due to the development of nicotine tolerance over the two-week period." The measure that was used here was local motor activity, which again is certainly indicative of peripheral effects. Nicotine at certain concentrations in certain administration doses does create a well-known syndrome, and that is, is that it does affect local motor activity.
Relating this to a human smoking situation, I know of no effect of -- on local motor activity in -- in human smoke -- smokers.
Q. All right. At least this study suggests that as of 1979 Philip Morris understood the notion of tolerance as related to nicotine?

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MR. FOWLER: Object to the form of the question.

Q. Correct?

A. There is no question in the literature that in 1979 the -- the information available with nicotine and the autonomic nervous system, that that is widely known. It's not just Philip Morris. Many scientists, virtually all scientists that had any autonomic pharmacology, knew that there was tolerance to peripheral effects with nicotine.

Q. When you first joined Philip Morris in 1980, was there an understanding amongst the people there that use of the word "addiction" was to be avoided?

A. No, and I think the best demonstration of that is Dr. DeNoble's documents themselves.

Q. Was there an understanding or a corporate culture, if you will, that any concession that nicotine from cigarettes may be addicting would have a negative impact on the company?

MR. FOWLER: Object to the form of the question and in particular with regard to time.

Q. At or about the time you joined in 1980.

A. At or about the time I -- I joined in 1980, I think that you will find work going on to explore those issues. I think you will find in the documents

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the word "addiction" used, and I think you will find that there was discussion and presentations.

So I do not agree with your characterization or find it consistent with my experience.

Q. If a smoker is addicted to cigarettes -- and I'd just ask you to accept that for now. I know you don't believe it, but accept it if you can.

If a smoker is addicted to his cigarettes, do you believe that that addiction affects the smoker's ability to freely choose whether to continue smoking or stop?

MR. FOWLER: Object to the form of the question.

A. In the classical definition used pharmacologically, objective criteria, that is indeed part of the premise of addiction, that one would have a situation whereby with both the intoxication, which then impairs judgment obviously, and also with the withdrawal that basically creates a biochemical change in the body such that the body physiologically requires a substance, those two would then interact to create a situation whereby the person did lose control.

Those situations are not apparent in smokers, and smokers do quit and have successfully quit.

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(Discussion off the stenographic record.)

BY MR. SILBERFELD:

Q. I want to move forward in time, Dr. Ellis, in our review of these documents to the year 1983. As of 1983, did Philip Morris believe that tolerance to nicotine in cigarette smokers was a well-established fact?

MR. FOWLER: Object to the form of the question.

A. As I recall from my analysis of our -- our documents, that the tolerance that was being referred to there was peripheral tolerance per se and the tolerance that's associated with beginning smokers, not the tolerance that is part of the definition or the classical objective criteria for addiction.

Q. Let me show you Plaintiffs' Exhibit 126, previously marked.

MR. FOWLER: Thank you.

Q. It is a memo dated March 16, 1983. Is this the document you were thinking of?

A. I believe so.

Q. Is this --

A. Yes.

Q. -- one of the documents you looked at in preparation for today?

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A. Not recently, no.
Q. In the second paragraph on the first page -- well perhaps I should go back and identify it.
It's a memo from Dr. Charles to Dr. Osdene; correct?
A. Correct.
Q. And Dr. Charles was in the research department?
A. Yes.
Q. And Dr. Osdene was his boss?
A. Yes.
Q. And the subject of the memo is "'Why People Smoke'"; right?
A. In quotes, yes.
Q. And Dr. Charles writes to Dr. Osdene, with a copy to Dr. DeNoble, in the second paragraph, quote, "There is one caution which should be considered before attacking the document. The third edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders defines substance dependence as," quote, "'. . . requires physiological dependence, evidenced by either tolerance or withdrawal,'" close quote. The paragraph goes on "The key word is either," underlined. "We can successfully defend the absence of withdrawal under controlled experiments, but we

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cannot defend tolerance."

A. Uh-huh.

Q. "Tolerance to nicotine is a well established fact."

That's what Philip Morris knew as of March 1983; isn't that true, ma'am?

MR. FOWLER: Object to the form.

A. My previous answer I think covers all aspects of that -- that statement. It was referring to peripheral tolerance and not the tolerance associated with the objective criteria of -- of addiction.

Q. Where does it say in the memo that it's referring to peripheral tolerance, please?

A. It does not. However, I seem to recall a number of years back discussing this with Dr. Charles, and he was referring to the, quote, "dizziness and nausea" that we were -- we saw in the other document. Those effects one sees when one first begins to smoke, which is very different from the other tolerance that we discussed earlier.

Q. But you agree with me that nowhere in Dr. Charles's memo does he use the word "peripheral effects"?

A. No, he does not use that word.

Q. Nor is there any word in this memo from which

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you can draw that conclusion based on just the memo?
A. No. I have subsequently drawn that conclusion upon discussion.
Q. With whom?
A. Dr. Charles.
Q. As of 1983, did Philip Morris believe that nicotine in cigarettes acts as a stimulant?
A. I think that it is not apparent that cigarettes as a stimulant or nicotine in cigarettes act as a stimulant. Behaviorally speaking, smokers are very similar in behavior to nonsmokers, so it certainly isn't apparent that that's the case.
It can under certain experimental conditions and at certain doses, as we've seen in earlier documents, have a variety of effects, so stimulating activity can be demonstrated in certain laboratory conditions.
Q. In fact, nicotine was described in the pharmacological literature as having very specific stimulating effects at about this time in the middle 1980s; isn't that true?
MR. FOWLER: Object to the form.
A. I suspect that that was probably discovered even before that.
Q. In fact, Goodman & Gilman, which is the bible of

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pharmacology -- is that an unfair way to characterize it?

A. No, it's not an unfair way.

Q. Goodman & Gilman, The Pharmacological Basis of Therapeutics -- that's the name of the text, is it not?

A. Yes.

Q. Said in 1980, three years before this memo, that nicotine has very specific stimulating effects; isn't that true?

A. At certain doses under certain conditions, yes.

Q. And if I could direct your attention to the third page of Exhibit 126, second paragraph from the end, Dr. Charles is being written to by Dr. DeNoble --

A. Uh-huh.

Q. -- and Dr. DeNoble here writes "The publication states that nicotine acts as a stimulant. This is basically correct. However, it also states its stimulant properties are like amphetamine. Let me quote Goodman et al.," and that's the reference to Goodman & Gilman.

A. Uh-huh.

Q. "'Nicotine appears to have very specific stimulant properties; its effects are not confused

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with those of other drugs.' The statement that," quote "'. . . it can act as an anti-anxiety" -- "anxiety agent like a tranquilizing drug, . . .' is to the best of my knowledge without empirical support."

Do you see that?

A. I see that. That's what the memo states.

Q. Did Philip Morris believe as of this time, in 1983, that nicotine acts as a stimulant, nicotine in cigarettes?

A. I think that there -- there will be in the literature and certainly within Philip Morris documents a number of references to subtle stimulating or depressive types of actions of nicotine as it relates to smoking, and that's called the biphasic or the paradox with smoking, that some people report stimulation and some people report depressive effects.

That's in the documents, and I just have to say that based on the behavior of smokers, there certainly isn't any overt behavior that is functionally apparent consistent with those statements, and if they do occur, it is extremely subtle.

Q. Let me have marked as next in order a memorandum

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dated June 1, 1983 by Dr. DeNoble and Dr. Mele, M-e-l-e -- have I said that correctly?

A. Mele.

Q. Mele, approved by Dr. Charles, and you are shown as being on the distribution list, I think. Let me mark it, and we'll talk about it.

(Discussion off the stenographic record.)

(Plaintiffs' Exhibit 1332 was marked for identification.)

BY MR. SILBERFELD:

Q. For the record, Exhibit 1332 bears Bates number 1005215302 through 311.

A. Yeah, it's missing some pages. This is the thinnest annual report from this --

Q. Dr. Ellis, this is the way we got it, so it wasn't us. You're --

You're the Dr. C. Ellis shown in the middle column of the distribution list?

A. Yes.

Q. All right. And --

MR. FOWLER: But it --

Q. -- the document actually begins on page 31?

A. Begins on page 31.

Q. Again, this is the way we received it. The only question I have about this is: Are we agreed, ma'am,

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that as of this time, in December of 1983, Philip Morris believed that it was well documented, as shown in the first line, that tolerance develops to many of the behavioral and physiological effects of nicotine following its repeated administration in laboratory animals?

A. Yes, and to -- to understand those statements, the physiological effects would relate to the peripheral effects, and the behavioral tolerance that was demonstrated by Drs. Mele and DeNoble also can relate to the physical effects and on the animal's ability to behaviorally respond and the effect on local motor activity.

So they're one and the same, and as measured in a rat, they would be consistent.

MR. SILBERFELD: Okay. I'd like to mark as next in order a multipage document dated June 29, 1983 from the Philip Morris USA Research Center. It bears Bates number 1000419009 through 068.

(Discussion off the stenographic record.)

(Plaintiffs' Exhibit 1333 was marked for identification.)

BY MR. SILBERFELD:

Q. Are you familiar with this report?

A. Yes.

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Q. You're again listed as having received it at or about the time that it was prepared. This is a report by Dr. Gullotta?

A. Yes.

Q. Approved by Dr. Charles?

A. Yes.

Q. And this is a report of some electrophysiological studies done by the Research Center in or about this time; is that right?

A. Yes.

Q. I know you've testified previously about the details of these PREP tests and studies. I just have a few questions about them if I may direct your attention to page six of the document. The page numbers appear at the bottom.

As of this time, in December of 1983, was it true that the effects of cigarette smoking on the PREP are extremely reliable?

A. It is true that Dr. Gullotta did get a consistent response under certain experimental conditions.

Q. And did you regard those at the time as being extremely reliable?

A. In terms of representing what normal smokers may experience, not necessarily. Dr. DeNoble's

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conditions of experimentation are -- create an abnormal situation in which the individual is put in an enclosed room, and it is my belief and certainly reasonable because many people did fall asleep in that room that some of the effects that is -- that were observed consistent with some of the studies that he did are probably not effects that would be observed in a normal individual performing normal activities.

Q. As of this time, in the summer of 1983, was it possible to conduct highly specific and systematic studies on the nature of the events that occur in the brain as a consequence of cigarette smoking?

A. Under these conditions, which were artificial, yes.

Q. One of the things that was done in the course of these PREP studies, if I could direct your attention to page 25, is a puff-by-puff analysis of cigarette smoking. Do you see that there, item number four?

A. Yes. Yes, I see the item number four.

Q. Okay. And the conclusion that was reached about the puff-by-puff analysis, because this whole page is the conclusions page, --

A. Uh-huh.

Q. -- says "The data suggest that only an extremely

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small amount of nicotine" --

A. Uh-huh.

Q. -- "... is necessary to produce CNS effects."

Have I read that correctly?

A. That's what the statement says.

Q. And did Philip Morris believe as of this time in 1983 that that was a proper and true scientific conclusion?

A. Based on the conditions of this experiment and the understanding that nicotine has sensory -- a sensory role in smoke, what could be measured in this situation is the sensory impact of nicotine on the trigeminal nerve, so there are a number of different ways that one could potentially interpret this work. And I think that exactly what EEG means, which involves a number of squiggles on a piece of paper, and the fact that EEGs can result or evoked potentials can result from any stimulus, I think making a determination as to the significance of that work is questionable.

Q. In or about the time that you received this report, did you ever write back to the author, Dr. Gullotta, or Dr. DeNoble or Dr. Charles or anyone within the company saying that that conclusion about the amount of nicotine necessary to cause a CNS

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effect in the brain should be cautiously described or cautiously used in the manner that you answered the question a moment ago? Did you ever do that?

MR. FOWLER: Object to the form.

A. Well two major points. First of all, I respect the right and certainly respect the environment of a research and development facility to have the documents reflect a variety of thoughts and opinions. I think that is part of creativity and innovation and also part of reflecting all potential hypotheses.

I also have to say that we have had subsequent discussions on this matter, a number of scientists together, so the discussion is still continuing. And we still have studies going on currently to look at and under -- try to understand what these effects might mean.

Q. Other than here today, have you ever expressed a view that the conclusion as reached by Dr. Gullotta and his colleagues about the amount of nicotine necessary to produce CNS effects should be viewed with caution?

A. Certainly that's been a -- whether or not that's specifically been discussed, I'm not sure, but certainly it has totally been discussed as a part of

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what these studies mean overall, yes, and certainly what these studies indicate and what is in Philip Morris documents does not necessarily mean that that is fact. It is generally meant that it is hypothesis or an idea that was being investigated or thought of at the time.

Q. Have you yourself ever urged caution about the meaning of Dr. Gullotta's puff-by-puff analysis?

A. Yes. In terms of specifically some of his studies, probably over a year and a half ago I spoke with Dr. Gullotta and Dr. Gerd Kobal, who is now currently doing studies, to address the issue of what these data mean.

MR. SILBERFELD: Let me mark as next in order a two-page letter from you to the Honorable Henry A. Waxman dated May 9, 1994 on the letterhead of Philip Morris USA.

(Plaintiffs' Exhibit 1334 was marked for identification.)

BY MR. SILBERFELD:

Q. You're familiar with this letter, are you not?

A. I certainly am.

Q. All right. The background of this letter, which bears Bates numbers 2028812092 and 3, is that you accompanied the president and CEO of your company,

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Mr. Campbell, --

A. Uh-huh.

Q. -- to the congressional hearing chaired by Congressman Waxman in the spring of 1994?

A. That's correct.

Q. And Mr. Campbell testified at that hearing; correct?

A. Correct.

Q. And you made some comments as well; isn't that true?

A. Yes.

Q. And both in the course of the hearing and afterwards Philip Morris and the other tobacco companies that were there were asked to supplement some of the information that had been provided by giving the congressional committee additional information; isn't that true?

A. Yes.

Q. This letter represents one effort by you to comply with that request; isn't that true?

A. Yes.

Q. And specifically, you testified or remarked at the congressional hearing about the meaning of addiction or dependence or habituation; isn't that true?

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A. Certainly "addiction" was the term that was specifically used.

Q. And in giving the testimony that you did, did you regard that as being the same as having taken an oath?

A. Yes, I took the oath.

Q. You did take the oath?

A. Yes.

Q. And what was your purpose in writing the May 4, 1994 letter which is Exhibit 1334?

A. It was, as it states, to address subsequent discussion relative to the content of my testimony and explain in fact the meaning of my words, which were being, I think, mistaken.

Q. Mistaken by whom?

A. Well, I'm not sure exactly specifically who was associated with the request, but certainly it was to respond to a request relative to the -- let's see. I think it is mentioned in here.

Yeah, the April 28th, '94 "hearing before the House Energy & Commerce Subcommittee on Health and ... Environment, you and Representative Wyden referred to portions of the testimony that I presented to the Subcommittee on April 14, 1994." So it refers to their discussion at that particular

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hearing.
Q. At that particular hearing you presented your view as to what the pharmacological definition of dependence is, and that is the same as you've expressed here today?
A. At the April 14th hearing, yes.
Q. Right. And there was some debate or -- or discussion about that point of view that you expressed; right?
A. I think it may have been misunderstood, and I was trying to clarify it.
Q. And in doing so, you wrote this letter?
A. That's correct.
Q. And in writing the letter, you acknowledged, did you not, that you did not intend by your testimony to suggest that certain research findings reported in the literature have led others to conclude that nicotine is addictive?
A. Absolutely not. It's throughout the literature, as represented in my bibliographies.
Q. And in terms of this difference, Dr. Ellis, between the medical or public health definitions of dependence or addiction and the pharmacological definition of dependence or addiction, in terms of that difference, do you have a view from a public

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health standpoint as to which definition should properly be used in determining whether a substance causes dependence or addiction?

MR. FOWLER: Object to the form of the question.

A. You refer to medical definitions of "addiction" when in fact the operative definition I think that's currently being used in the United States is DSM-IV, and that is a definition of "dependence." So I'm not sure there exists in the United States per se a recognized definition of existence [sic] and we've gone away from that term, so I find it hard to respond to your question because of that and the nature of it.

Q. Okay. Let me extract from my question --

A. Okay.

Q. -- any reference to addiction at all and just --

A. Okay.

Q. -- use dependence.

For purposes of making judgments --

A. Uh-huh.

Q. -- about the health of individuals and the health of the population of this country --

A. Yes.

Q. -- do you believe that the appropriate

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definition for medical professionals and public health professionals to use is the DSM-IV definition of "dependence"?

A. As I've --

MR. FOWLER: Object to the form of the question, but you can go ahead and answer.

A. As I've previously stated, I think that definition is very broad and can cover a number of items and leads to confusion. I think it would be in the best interests -- interest of the public and the medical community to have specific definitions, and I think that was in part the nature of my testimony.

Q. The definition of "dependence" as expressed in DSM-IV, which we talked about earlier today, is the definition that is accepted by every major medical and public health organization in this country; isn't that true?

MR. FOWLER: Object to the form of the question.

A. Well, I think that it is -- it is the operative definition. I think I have also read quite extensively that there is concern about the breadth of the definition in terms of its application to a variety of human situations.

Q. From your understanding of the medical

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literature on the subject of nicotine and its effects, you understand, do you not, that every leading medical organization has concluded that nicotine is either addictive or dependence producing?

MR. FOWLER: Object to the form.

A. I think that certainly every -- every organization has made some proclamation in that direction. Whether they've used those words, I'm not sure. However, in the context that the word "addiction" has been used, I am not sure exactly what that means.

Q. The American Medical Association concluded that nicotine is addicting in 1993, did it not?

A. Specifically if that's the date, I'm not sure.

Q. The World Health Organization concluded that in 1992?

A. Approximately that time frame under their definition.

Q. The Surgeon General of the United States concluded that in 1986 and again in 1988?

A. '88, uh-huh.

Q. The American Psychiatric Association concluded that in 1980 with DSM-III and again in 1994 with DSM-IV?

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MR. FOWLER: Object to the form.

A. And Surgeon General Koop has in the '90s, in the early '90s, also concluded that video games are addictive, so I cautioned about the use of that terminology and what it fundamentally means in the context of what we're talking about today.

Q. Have you in the course of your literature review seen any reports of the views of scientists who receive funding from either the tobacco companies directly or from organizations such as The Council for Tobacco Research on the subject of nicotine and addiction?

THE WITNESS: Could I have the first part of that read back, or just read the whole thing.

(Record read by the court reporter.)

A. Not that I can sit here and recall today, no.

Q. Are you familiar with a -- a survey that was done in 1989 that showed that over 80 percent of scientists who received funding for their work from the tobacco industry strongly agreed that nicotine was addictive?

MR. FOWLER: Object to the form of the question.

Q. Are you aware of that work?

MR. FOWLER: I'm sorry.

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A. I'm not aware of that.
Q. Are you aware of that same study finding that in -- another 15 percent of scientists agreed somewhat that cigarette smoking is addictive?
MR. FOWLER: Object to the form of the question.
A. I'm obviously not aware of it.
Q. From your review of the literature, are you aware of any medical or public health organization that has looked at the issue of whether nicotine is addictive that has concluded that it is not addictive?
A. In the context of the Drug Abuse Advisory Committee that did meet a number of years ago and continues to meet and approve certain nicotine cessation devices, such as gum, patch and the Nicotrol, yes, there is a conclusion that nicotine has low abuse potential in those devices. In the Drug Abuse Advisory Committee held a couple of years ago there was not unanimous opinion as to the role of nicotine in cigarette smoke as it relates to dependence production, issues of behavioral dependence. Issues of the fact that nicotine cessation and replacement does not effectively deal with the situation were all brought up in those

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hearings.

So there are scientists and officials that do question and at least still do say that there is probably some question about the extent of the information available.

Q. You agree, do you not, on behalf of Philip Morris that nicotine in cigarettes affects the structure and function of the human body?

MR. FOWLER: Object to the form of the question.

A. I agree that nicotine per se can affect the structure and function of the body as many other substances that are taken into the body can and do.

Q. Nicotine in cigarettes does in fact affect the structure and function of the human body?

MR. FOWLER: Object to the form of the question without a definition of those terms.

A. To the extent that nicotine can bind to the acetylcholine receptor and in that sense it can affect the structure, that statement is correct.

Q. And it affects the function of the human body in the sense that cigarettes containing nicotine have central nervous system effects; right?

A. Whether or not those are entirely due to nicotine, again it depends on what effect we're

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looking at.

Q. Nicotine in cigarettes affect the peripheral nervous system?

A. Again I think that's a very complex situation. There's no question nicotine can affect the peripheral nervous system. That's not the point. The role of nicotine in cigarette smoke is very complex because of the complex environment of smoke.

Q. Nicotine in cigarettes causes cardiovascular effects; isn't that true?

A. Certainly you can demonstrate an increase in heart rate, a slight increase in blood pressure. Many of those effects are very subtle, if that's what you are referring to.

Q. Is the question of whether cigarette smoking and nicotine in cigarettes a dependence, if that's an open question in the mind of Philip Morris today, is it reasonable for smokers to believe the same thing?

MR. FOWLER: Object. If you understand it, go ahead. Object to the form of the question.

THE WITNESS: Yeah.

MR. FOWLER: It's confusing.

MR. SILBERFELD: Well let me -- if it's confusing, let me start again. I just want it to be clear.

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Q. Do you believe as the representative of Philip Morris here today that whether cigarette smoking produces a dependence upon nicotine in cigarettes is an open question?

A. I think again we have to define "dependence." The -- the -- the issue here is -- is -- is what is the dependence, and are -- the issue with smoking is are you talking about a behavioral or psychological dependence on an act or are you talking about a substance dependence? I don't think it's clear and I don't think you can tweeze those two aspects apart effectively to study that and to come up with a clear answer.

Q. Is it reasonable for smokers in this country and particularly in the state of Minnesota to also share that confusion; that is, that it's not clear whether cigarette smoking produces dependence? Is that reasonable?

MR. FOWLER: Object to the form of the question, but you can answer.

THE WITNESS: Would you read that back, please.

(Record read by the court reporter.)

A. I guess if -- if we have broad definitions of "dependence," and I think it is a very confusing

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topic for everybody, not just for smokers.
Q. If the health professionals are confused about the subject of dependence, if Philip Morris and other cigarette makers are not clear about whether their products cause dependence, it's reasonable, is it not, for the lay public also to share in that confusion?
MR. FOWLER: Object to the form of the question.
A. If you don't have objective criteria, it's very difficult to have a clear view of something.
Q. Okay.
THE REPORTER: Can we go off the record?
MR. SILBERFELD: Sure.
(Recess taken.)
BY MR. SILBERFELD:
Q. Dr. Ellis, if Philip Morris concluded that nicotine in cigarettes produces a dependence upon cigarettes, would it disclose that to the American public?
A. Certainly if we had data that indicated such a status, that it would be communicated to the appropriate people to determine how that should be effectively communicated to the consumer.
Q. That would be an extremely important finding of

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the kind that the company would want to make public in some fashion; --

MR. FOWLER: Object --

Q. -- right?

MR. FOWLER: I'm sorry. Object to the form of the question.

A. Certainly if -- if there is any finding, I think that it behooves everyone to take a look at the data, to take a look at the status of the data and to determine exactly the most effective way of dealing with it in the context of the consumer, and it would not be, in my opinion, appropriate for Philip Morris by themselves to create communication relative to some of the specific warnings that are on the pack because that is dictated by Congress and we are precluded from doing anything about those.

Q. So if Philip Morris became satisfied that nicotine in cigarettes produces a dependence upon cigarettes, Philip Morris would work with government hand in hand to convey that information in an appropriate way to the American people?

MR. FOWLER: Object to the form.

A. Government and regulatory authorities.

Q. Regulatory authorities such as?

A. Well, FTC, for example.

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Q. Yeah, I meant to include that --
A. Sure.
Q. -- in government.
A. Right.
Q. If Philip Morris became satisfied that nicotine in cigarettes produced a dependence in smokers but other companies, your competitors, did not conclude the same thing, would Philip Morris nevertheless work with government to make that information available to the American people?

MR. FOWLER: Object to the form of the question. It's an incomplete hypothetical.

A. Yeah, I -- that is very hypothetical. However, I don't see what difference it would make relative to the actions of -- of our company.
Q. So the fact that other companies, other cigarette makers, came to the same conclusion or didn't wouldn't affect the behavior of Philip Morris, would it?
A. I -- I just said that it shouldn't make any difference.

MR. SILBERFELD: Thank you. That's all I have on this topic. Thank you.

MR. FOWLER: All right. So we're concluded for today?

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MR. SILBERFELD: Yes. Let's -- you wanted a statement as to where we were.

MR. FOWLER: Correct, thank you.

MR. SILBERFELD: And I'm pleased to make it.

We have concluded in the course of the last two days Dr. Ellis's expert testimony; we did that yesterday. We've concluded her 30.02(f) testimony on the subject of nicotine and addiction. We've concluded her 30.02(f) testimony on the subject of research and development; that was done this morning. And lastly, we concluded her 30.02(f) testimony on the subject of nicotine manipulation; that was the examination done by Mr. Gordon this morning.

What remains for us to conclude on another day is Dr. Ellis's 30.02(f) testimony on smoking and health and public statements, and as I understand it, we're going to reconvene at some point in the very near future to do that.

MR. FOWLER: Consistent with everybody's schedules.

MR. SILBERFELD: Of course.

MR. FOWLER: Right. Thanks very much.

MR. SILBERFELD: Doctor, thank you.

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THE WITNESS: Thank you.

THE REPORTER: Off the record, please

(Deposition recessed at 4:36 o'clock p.m.)

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C E R T I F I C A T E

I, William C. LaBorde, hereby certify that I am qualified as a verbatim shorthand reporter; that I took in stenographic shorthand the testimony of CATHY ELLIS at the time and place aforesaid; and that the foregoing transcript consisting of pages 293 through 541, Volume II, is a true and correct, full and complete transcription of said shorthand notes, to the best of my ability.

Dated at Las Vegas, Nevada, this 26th day of September 1997.

WILLIAM C. LaBORDE
Registered Professional Reporter
Notary Public

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C E R T I F I C A T E

I, CATHY ELLIS, the deponent, hereby certify that I have read the foregoing transcript consisting of pages 293 through 541, Volume II, and that said transcript is a true and correct, full and complete transcription of my deposition, except per the attached corrections, if any.

(Please check one.)

____ Yes, changes were made per the attached (no.) ____ pages.

____ No changes were made.

CATHY ELLIS
Deponent

Sworn and subscribed to before me this day of 199__.

Notary Public

My commission expires: (WCL)

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